United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the Du Page County Board and the Illinois Agricultural Experiment Station

Soil Survey of Du Page County, Illinois

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How To Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area, descriptions of the detailed soil map units and soil series in the area, and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties.This part may be updated as further information about soil management becomes available. Part III includes the maps.

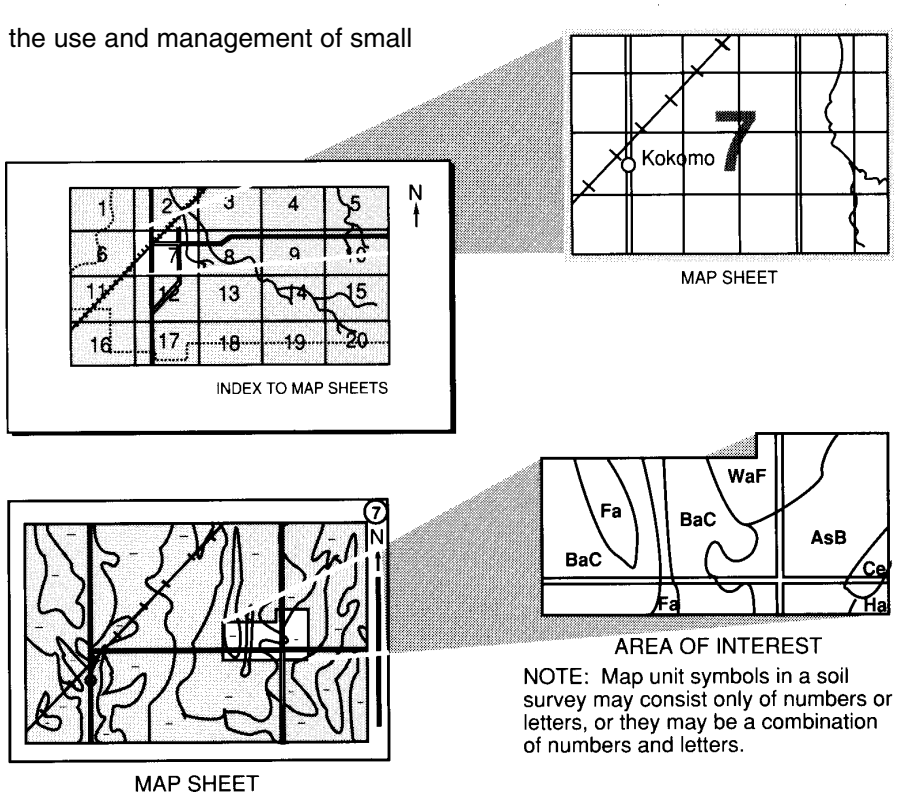
Detailed Soil Maps

These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1997. Soil names and descriptions were approved in 1997. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1997. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Kane-Du Page County Soil and Water Conservation District. Additional funding was provided by the Du Page County Board and the Illinois Department of Agriculture.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: During the past several decades, the major land use in Du Page County has shifted from agriculture to urban development.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Contents

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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Soil Survey of
Du Page County, Illinois—Part I

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United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Du Page County Board and the Illinois Agricultural Experiment Station

Du Page County is in northeastern Illinois (fig. 1). It has an area of 215,455 acres, or 337 square miles. In 1990, the population of the county was 781,666 (U.S. Department of Commerce, 1990). Wheaton is the county seat. Naperville, Wheaton, Downers Grove, and Elmhurst are the largest cities. The county is bordered by Cook County on the north and east, by Will County on the south, and by Kane County on the west.

This soil survey is a subset of MLRA (major land resource area) 110, the Northern Illinois and Indiana Heavy Till Plain (USDA, 1981). It is an update of the Du Page County part of the survey of Du Page County and part of Cook County, Illinois, published in 1979 (Mapes, 1979). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the Survey Area

This section provides general information about Du Page County. It describes history; physiography, relief, and drainage; natural resources; urbanization; agriculture; transportation facilities; industry; and climate.

History

When Marquette and Joliet first explored the survey area in 1673, the Potawatomi Indians were the main inhabitants. Smaller groups of Illinois and Ottawa Indians were also in the area. The county was first settled in 1830 by Bailey Hobson, who later established a mill. He took up residence near what was to become Naperville, the oldest town in the county. Naperville was first settled by John and Joseph Naper in 1831.

Du Page County took its name from the Du Page River, which was named after a French fur trader, DuPazhe. He built a trading post and home at the fork of the east and west branches of the river in 1800.

Du Page County was established by the Illinois Legislature on February 28, 1839. It was originally part of Cook County. Naperville served as the county seat until 1867. The county seat was then moved to Wheaton because of that community's central location within the county.

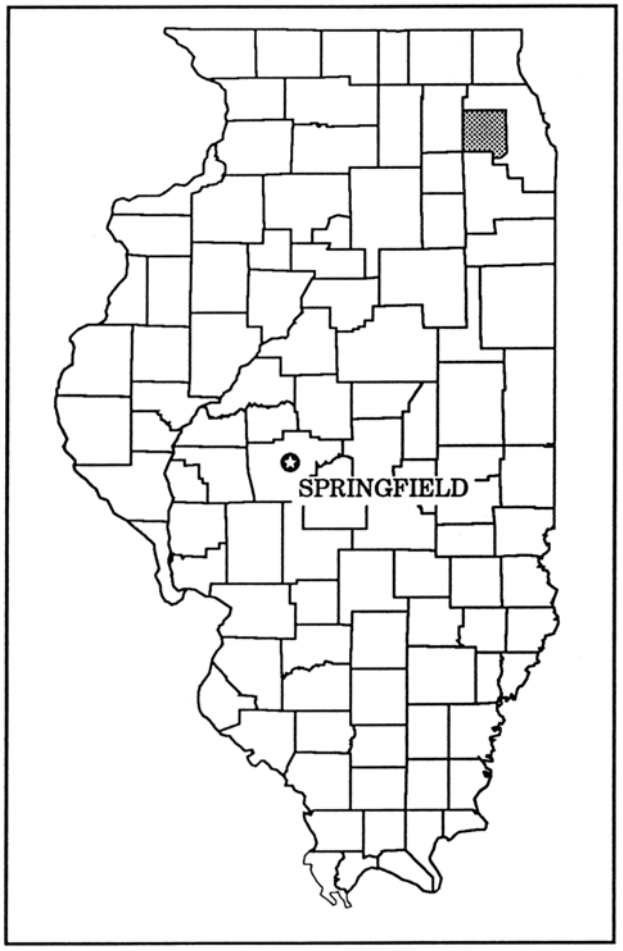

Figure 1.—Location of Du Page County in Illinois.

Physiography, Relief, and Drainage

Du Page County is characterized by moraines, outwash plains, lake plains, kames, stream terraces, flood plains, and bogs. The county is in the Central Lowland Province (Leighton and others, 1948). Two subdivisions of this province are in the survey area—the Great Lake Section and the Till Plains Section. The Great Lake Section, which is made up of the Wheaton Morainal Country, makes up the majority of the county. The Till Plains Section is in the southwestern part of the county. It is made up of the Bloomington Ridged Plain.

Generally, the land surface elevation is highest in the northwestern part of the county. The land surface gradually slopes to the southeast. The highest elevation in the county, about 855 feet above sea level, is at Mt. Hoy. The lowest elevation, about 585 feet above sea level, is in the Des Plaines River valley in the southeastern part of the county (Taylor and Gilkeson, 1977).

The major moraines that run through the county are the Keeneyville, Tinley, Valparaiso, Wheaton, and West Chicago Moraines. The West Chicago Moraine is in western Du Page County; the Wheaton, Keeneyville, and Valparaiso Moraines generally run through the central portion of the county; and the Tinley Moraine is in the eastern part.

The central part of Du Page County is drained by the West and East Branches of the Du Page River, which generally flow to the south. The northeastern part is drained by Salt Creek, which flows to the south-southeast. The southeast corner of the county is drained by the Des Plaines River, which flows to the southwest. The northwest and southwest corners of Du Page County are drained by tributaries that eventually empty into the Fox River.

Natural Resources

Portions of Du Page County are underlain by sand and gravel. The importance of sand and gravel deposits as mineral resources depends on the thickness and extent of the deposit, mineralogy, accessibility, and amount of overburden. Economically valuable sand and gravel deposits occur primarily in the valley trains of the East and West Branches of the Du Page River and on outwash plains, one of which is located in the northwestern part of the county.

Ground water is available from two aquifer systems (Taylor and Gilkeson, 1977). The first is a shallow system of dolomitic rocks, dolomitic beds, and sand and gravel deposits in glacial drift. The second is a deep aquifer composed of sandstone and dolomite formations. The population of the survey area has increased rapidly, and demands for water exceeded the supply available from the aquifers. A number of communities now import their water from Lake Michigan.

The bedrock of Du Page County consists primarily of dolomites. The bedrock is of sufficient quality for making most grades of construction aggregates. Crushed stone was produced by several quarries throughout the county in past years.

Urbanization

In 1840, soon after Du Page County was officially established, the population was only 3,535. By 1850, however, the population of the county had increased to 9,290, and by 1900, it had increased to 28,200 (Du

Page County Development Department, 1996). The population increased by 66 percent during that time period.

As Chicago continued to grow and with the advent of industry and technology, the population of the survey area increased dramatically. By 1980, it had risen to 650,000. The 1990 census reported 781,666 residents in Du Page County, which represents a 20 percent increase over the 1980 figure (U.S. Department of Commerce, 1990). Du Page County is one of the fastest growing counties in Illinois and is the 53rd most populous county in the United States.

Although agriculture was the primary livelihood in 1955, when agriculture made up 58 percent of the total land use, only 8.6 percent of the land was still used for agricultural purposes in 1992 (Du Page County Development Department, 1996). Over the past several decades, people migrating to the suburbs from the city have greatly impacted land usage. The majority of the county has been developed for residential use. The eastern half of the county has many commercial and industrial establishments. Despite the intense development of Du Page County, there are numerous city parks and many forest preserves. These areas provide a balance in land use and help to preserve environmental and natural resources.

Agriculture

The rapid growth in population and the subsequent urbanization of Du Page County have resulted in a tremendous change in land use patterns. The number of farms in Du Page County declined from 207 in 1982 to 95 in 1992 (U.S. Department of Commerce, 1992). The average farm size has increased from 157 to 192 acres, but the total acreage in farms decreased from 123,860 acres in 1955 to 18,206 acres in 1992.

Agriculture in Du Page County consists primarily of commodity crop production and some livestock production and specialty crops, such as vegetables, turf, and landscape materials. The largest agricultural land use is the production of corn, soybeans, and hay. About 49 percent of the cropland acreage is used for corn, 37 percent for soybeans, and 4 percent for hay.

Transportation Facilities

Du Page County's transportation system provides passenger and freight access to the Chicago, De Kalb, and Joliet areas. The road network includes the East-West Tollway (I-88) (fig. 2), the North-South Tollway (I-355), the Eisenhower Expressway (I-290), a small portion of the Tri-State Tollway (I-294), and the Stevenson Expressway (I-55); U.S. Highways 20 and 34; and State Highways 19, 38, 53, 56, 59, 64, and 83. Du Page County itself has a well developed road system that provides easy access among its many communities.

Commuter rail is an important public transportation source in Du Page County. In 1995, more than 34,000 passengers boarded commuter rail lines each weekday (Du Page County Development Department, 1996). These rail lines run from east to west through the county and provide direct access to Chicago. Freight is also shipped through the county by rail.

Du Page County is serviced by one general aviation airport, Du Page Airport, which is outside West Chicago. In addition, one of the world's busiest airports, Chicago O'Hare International, extends into the northeastern part of the county.

Industry

In addition to increases in population during the past decade, economic opportunities have also expanded in Du Page County. Not only has employment increased about 6 percent over the past several years, but the number of business establishments also has increased substantially. From 1989 to 1993, 2,374 new firms were established. This number represents a 9.5 percent increase (Du Page County Development Department, 1996).

Du Page County has more than 25,000 business establishments. Major industries are manufacturing, wholesale and retail trade, construction, transportation and public utilities, and a variety of service agencies, including education, health, and hotel and lodging. Du Page County is also home to Argonne and Fermi National Laboratories.

Climate

Table 1 provides data on temperature and precipitation for the survey area as recorded at Wheaton in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 24.7 degrees F and the average daily minimum temperature is 18.9 degrees. The lowest temperature on record, which occurred at Wheaton on January 20, 1985, is -26 degrees. In summer, the average temperature is 72 degrees F and the average daily maximum temperature is 84.3 degrees. The highest recorded temperature, which occurred at Wheaton on July 14, 1995, is 105 degrees.

Figure 2.—The East-West Tollway provides easy access from Du Page County to Chicago and other metropolitan areas.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 36.62 inches. Of this, 19.6 inches, or about 54 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 13.89 inches. The heaviest 1-day rainfall on record was 9.24 inches at Wheaton on July 18, 1996. Thunderstorms occur on about 38 days each year, and most occur from June to August.

The average seasonal snowfall is 36 inches. The greatest snow depth at any one time during the period of record was 29 inches on January 25, 1979. The heaviest 1-day snowfall on record was 11.9 inches on January 14, 1979. On the average, 42 days per year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 67 percent of the time possible in summer and 47 percent in winter. The prevailing wind is from the southwest. The average windspeed is highest, between 11 and 12 miles per hour, from November to April.

Tornadoes and severe thunderstorms strike occasionally. They are of local extent and of short duration and cause only sparse damage in narrow areas. Hailstorms sometimes occur during the warmer periods.

How This Survey Was Made

Soil surveys are updated as part of maintenance projects that are conducted for a major land resource area or other region. Maintaining and coordinating soil survey information within a broad area result in uniformly delineated and joined soil maps and in coordinated interpretations and map unit descriptions for areas that have similar physiography, climate, and land use.

Updated soil survey information is coordinated within the major land resource area or other region and meets the standards established and defined in the memorandum of understanding. Soil surveys that are consistent and uniform within a broad area enable the coordination of soil management recommendations and a uniform program application of soil information.

This survey was made to provide updated information about the soils and miscellaneous areas in the survey area, which is a subset of MLRA 110. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the degree of erosion; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. To study the soil profile, which is the sequence of natural layers or horizons in a soil, soil scientists examine the soil with the aid of a soil probe or spade. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landscape or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Fieldwork in Du Page County consisted primarily of soil transects conducted by soil scientists. Soil transects are a systematic way of sampling a specific soil type. Soil borings were taken at regular intervals. Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, soil reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil

scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

Aerial photographs used in this survey were taken in 1993. Soil scientists also studied U.S. Geological Survey topographic maps and ortho-photographs to relate land and image features. Specific soil boundaries were drawn on the ortho-photographs. Adjustments of soil boundary lines were made to coincide with the U.S. Geological Survey topographic map contour lines and tonal patterns on aerial photographs.

Formation and Classification of the Soils

This section relates the soils in the survey area to the major factors of soil formation and describes the system of soil classification.

Formation of the Soils

Soil forms through processes that act on deposited geologic material. The main factors of soil formation are the physical and mineralogical composition of the parent material; the climate under which the soil formed; the plant and animal life on and in the soil; relief; and the length of time the processes of soil formation have acted on the parent material (Jenny, 1941).

Climate and plant and animal life are the dominant active factors of soil formation. They act directly on the parent material, either in place or after it has been moved by water, wind, or glaciers, and slowly change it into a natural body that has genetically related horizons. Relief modifies soil formation and can inhibit soil formation on the steeper, eroded slopes and in wet depressional or nearly level areas by controlling the moisture status of soils. Finally, time is needed for changing the parent material into a soil that has differentiated horizons.

The factors of soil formation are so closely interrelated and conditioned by each other that few generalizations can be made regarding the effects of any one factor unless the effects of the other factors are understood.

Parent Material

Parent material consists of the unconsolidated geologic formations in which a soil forms. The soils of Du Page County were derived from parent materials that were directly or indirectly impacted by the Wisconsin glaciation. The parent materials in Du Page County include glacial till, glacial outwash, loess (or silty material), lacustrine sediments, organic deposits, alluvium, and bedrock.

Glacial till is nonstratified drift transported and deposited directly by glacial ice. It is made up of a compact mixture of gravel, sand, silt, and clay. The glaciers deposited an extensive morainic system in the survey area. The major moraines, from west to east, include the West Chicago, Wheaton, Keeneyville, Valparaiso, and Tinley Moraines. The two principal parent materials in Du Page County include the Wadsworth Formation and the Lemont Formation, which contains the Yorkville till member (Hansel and Johnson, 1996). Soils that formed in material derived from these formations include the poorly drained Ashkum soils and the moderately well drained Ozaukee and Varna soils.

Glacial outwash was deposited by running meltwater from glaciers. The particle size of the material that was deposited depends on the speed of the stream or river. As the water velocity slowed, the larger particles were deposited first; with further reduction in velocity, the smaller particles were deposited. The finer particles were carried a greater distance by slower moving water. Outwash deposits in Du Page County range from loamy sediments to a mixture of coarse sand and gravel. Fox and Warsaw soils formed in loamy outwash over sandy and gravelly deposits. Significant outwash plains are principally along the East and West Branches of the Du Page River, the Des Plaines River, and some of the smaller tributaries.

Sometime after the glaciers retreated, conditions became drier and the winds increased. A thin, discontinuous layer of silty material, or loess, was deposited over the county directly by the winds. The primary sources of the loess were the flood plains along major rivers. Some of the silty material in the county may be of local origin since it contains more sand than is typical for loess. Depth of the loess or silty material generally ranges from 1.0 to 3.5 feet.

In areas where drainage was blocked, shallow lakes were formed. Lacustrine sediments were deposited from the still or ponded glacial meltwater. After the coarser particles were deposited by moving water, the finer particles, such as very fine sand, silt, and clay, settled in still water. Martinton and Milford soils formed in lacustrine deposits.

Organic deposits consist of decomposed plant remnants. After the glaciers receded, water was left standing in depressional areas. As a result, these areas were very wet during soil formation, and the decaying plant material accumulated more quickly

than it decomposed. Most of these plant remains are so decomposed that they are unrecognizable. These organic deposits are called sapric material. Examples of soils that formed in these deposits are Muskego and Houghton soils.

Alluvium is material and sediments recently deposited by streams and rivers on their flood plains. The texture of alluvium varies, depending on the velocity of the water source. Sawmill soils formed in silty alluvium.

Underlying the unconsolidated deposits in Du Page County is layered Silurian dolomitic bedrock. Depth to the bedrock ranges from 0 to 200 feet in the county (Taylor and Gilkeson, 1977). Romeo soils are very shallow to bedrock, and Faxon and Rockton soils are moderately deep.

Climate

Du Page County has a temperate, humid continental climate. The general climate has had an important overall influence on the characteristics of the soils. It is essentially uniform throughout the county, however, and has not caused any major differences among the soils.

Climate has very important effects on weathering, vegetation, and erosion. The weathering of minerals in the soil increases as temperature and rainfall increase. As water moves downward, clay is moved from the surface soil to the subsoil, where it accumulates. The water also dissolves soluble salts and leaches them downward. Climate also influences the kind and extent of plant and animal life. The climate in Du Page County has favored prairie grass and hardwood forests. Heavy rains can harm exposed areas of soil that are farmed or are in the process of being developed. Spring rains and wind can cause extensive erosion when crop residue, trees, or other vegetative cover is removed from the surface. More soil will be lost through erosion each year than is formed by natural processes.

Living Organisms

Soils are affected by the vegetation under which they formed. The main contribution of the vegetation and biological processes is the addition of organic matter and nitrogen to the soil. The amount of organic material in the soil depends on the kind of native plants that grew on the soil. Grasses have many fine, fibrous roots that add large amounts of organic matter to the soil when they die and decay. Soils that formed under prairie vegetation, therefore, have a thick, black or dark brown surface layer. Barrington, Elliott, and Mundelein soils formed under prairie vegetation. In contrast, the soils whose native vegetation was deciduous trees have a thin, light-colored surface layer because less organic matter is added to the soil. Blount, Ozaukee, and Zurich soils formed under forest vegetation (fig. 3).

Bacteria, fungi, and other micro-organisms help to break down the organic matter and thus provide nutrients for plants and other soil organisms. The stability of soil aggregates (structure units made up of sand, silt, and clay) is affected by microbial activity because cellular excretions from these organisms help to bind soil particles together. Stable aggregates help to maintain soil porosity and promote favorable relationships among soil, water, and air. Moreover, earthworms, crayfish, insects, and burrowing animals tend to incorporate organic matter into the soil and help to keep the soils open and porous.

Human activities are also important factors in Du Page County. Urban and industrial expansion has resulted in a significant amount of land being drained, cleared, and excavated and filled. These practices have had a pronounced effect on past soil formation and on present and future soil development.

Relief

Relief, which includes elevation, topography, and water table levels, largely determines the natural drainage of soils. In Du Page County, the slopes range from 0 to 30 percent. Natural soil drainage classes in the county range from excessively drained on the side slopes and ridges to very poorly drained in depressions.

Relief affects the depth to a seasonal high water table or the natural drainage of the soil by influencing infiltration and runoff rates. The poorly drained Ashkum and Drummer soils are in low-lying, nearly level areas and have a water table close to the surface for most of the year. The soil pores contain water, which restricts the circulation of air in the soil. Under these conditions, iron and manganese compounds are chemically reduced. As a result, the subsoil is dull gray and mottled. In areas of the more sloping, well drained Fox and Warsaw soils, the water table is at a lower depth and some of the rainfall runs off the surface. The soil pores contain less water and more air. The iron and manganese compounds are well oxidized. As a result, the subsoil is brown.

Local relief also influences the severity of erosion. Even though some erosion occurs on almost all sloping soils, the hazard of erosion generally is more severe as the slope increases. Runoff and the removal of soil material on these slopes result in the formation of soils that have a thinner solum than soils in less sloping areas.

Figure 3.—The soils in the foreground, which formed under prairie vegetation, have a thicker and darker surface layer than the soils that formed under forest vegetation.

Time

The length of time needed for the formation of a soil depends on the other factors of soil formation. Soils form more rapidly and are more acid if the parent material is low in lime content. Thus, more rapidly permeable soils form more readily than soils that have slower permeability because lime and other soluble minerals are leached more quickly. Forest soils form more quickly than prairie soils because grasses are more efficient in recycling calcium and other bases from the subsoil to the surface layer. Soils in humid climates that support good growth of vegetation form more rapidly than those in dry climates.

The length of time that the parent materials have been in place determines, to a great extent, the degree of profile development. Most of the soils in Du Page County began formation with the retreat of the last glacier about 12,500 years ago. On the flood plains, however, material is deposited during each flood. This continual deposition slows development.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 4 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation.

Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquoll (*Aqu*, meaning water, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Endoaquolls (*Endo*, meaning within, plus *aquoll*, the suborder of the Mollisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Endoaquolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, cation-exchange activity class, temperature regime, thickness of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, superactive, mesic Typic Endoaquolls.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series. An example is the Ashkum series.

Soil Series and Detailed Soil Map Units

In this section, arranged in alphabetical order, each soil series recognized in the survey area is described. Each series description is followed by descriptions of the associated detailed soil map units.

Characteristics of the soil and the material in which it formed are identified for each soil series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1999). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given in Part II of this survey.

A map unit delineation on the detailed soil maps represents an area on the landscape and consists of one or more soils or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit. The principal hazards and limitations to be considered in planning for specific uses are described in Part II of this survey.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying layers, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying layers. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on

the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Ozaukee silt loam, 4 to 6 percent slopes, eroded, is a phase of the Ozaukee series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Casco-Rodman complex, 20 to 30 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Muskego and Houghton mucks, 0 to 2 percent slopes, is an undifferentiated group in this survey area.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. The map unit Pits, gravel, is an example.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see Contents) give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Ashkum Series

Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Moraines and till plains
Parent material: Silty colluvium and the underlying silty clay loam till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Ashkum silty clay loam, 0 to 2 percent slopes, at an elevation of 705 feet, 96 feet south and 2,030 feet east of the northwest corner of sec. 22, T. 34 N., R. 11 E., in Will County; USGS Prairie Center topographic quadrangle; lat. 41 degrees 25 minutes 28 seconds N. and long. 87 degrees 57 minutes 24 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; many very fine roots; neutral; clear smooth boundary.

A—7 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common very fine roots; neutral; clear smooth boundary.

BAg—12 to 18 inches; dark gray (2.5Y 4/1) silty clay loam; moderate very fine and fine subangular blocky structure; firm; common very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; common fine very dark gray (7.5YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; neutral; clear smooth boundary.

Bg1—18 to 29 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine very dark gray (7.5YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; neutral; clear wavy boundary.

2Bg2—29 to 49 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine very dark gray (7.5YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent yellowish brown (10YR 5/8) and common fine and medium distinct brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and medium distinct gray (5Y 5/1) iron depletions in the matrix; 8 percent gravel; neutral; gradual wavy boundary.

2BCg—49 to 54 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to weak coarse angular blocky; firm; few very fine roots; common fine very dark gray (10YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent yellowish brown (10YR 5/6) and distinct brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and

medium faint gray (2.5Y 5/1) iron depletions in the matrix; 8 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.
2Cg—54 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; common fine prominent yellowish brown (10YR 5/6) and common fine and medium distinct brown (10YR 5/3) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; 8 percent gravel; strongly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the silty colluvium: 15 to 40 inches
Depth to carbonates: 22 to 50 inches
Thickness of the solum: 30 to 55 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam, silt loam, or silty clay

Bg horizon:
Hue—2.5Y, 5Y, or neutral
Value—3 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

2Bg horizon:
Hue—2.5Y, 5Y, 5GY, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

2Cg horizon:
Hue—2.5Y, 5Y, 5GY, or neutral
Value—5 or 6
Chroma—0 to 2
Texture—silty clay loam

232A—Ashkum silty clay loam, 0 to 2 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Silty colluvium and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Ashkum and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have no subsurface layer
- Soils that contain less clay in the subsoil
- Soils that are overlain by recent, light-colored deposition

Dissimilar soils:
- The somewhat poorly drained Beecher, Blount, and Elliott soils in the slightly higher positions on the landform
- Clayey Orthents in positions on the landform similar to those of the Ashkum soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

854B—Markham-Ashkum-Beecher complex, 1 to 6 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform:
Markham—summits, shoulders, and backslopes
Ashkum—toeslopes and depressions
Beecher—summits, backslopes, and footslopes

Soil Properties and Qualities

Drainage class:
Markham—moderately well drained
Ashkum—poorly drained
Beecher—somewhat poorly drained
Parent material:
Markham—thin mantle of silty material and the underlying silty clay loam till
Ashkum—silty colluvium and the underlying silty clay loam till
Beecher—thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this

section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Markham and similar soils: 35 percent
Ashkum and similar soils: 30 percent
Beecher and similar soils: 30 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have a thicker surface layer
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that have a lighter colored surface layer
- Soils that contain less clay in the subsoil

Dissimilar soils:
- The very poorly drained Houghton, Muskego, and Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Barrington Series

Drainage class: Moderately well drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Silty material and the underlying loamy outwash
Slope range: 2 to 4 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Barrington silt loam, 2 to 4 percent slopes, at an elevation of 627 feet, 400 feet north and 190 feet west of the center of sec. 16, T. 30 N., R. 3 E., in Livingston County; USGS Long Point topographic quadrangle; lat. 41 degrees 4 minutes 3 seconds N. and long. 88 degrees 52 minutes 52 seconds W., NAD 27:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

BA—11 to 16 inches; brown (10YR 4/3) silty clay loam; weak fine subangular blocky structure parting to moderate fine granular; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—16 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—21 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

Bt3—26 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine prismatic structure parting to moderate medium angular blocky; friable; few distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; neutral; clear smooth boundary.

2Bt4—32 to 37 inches; yellowish brown (10YR 5/4) silt loam; weak fine prismatic structure parting to weak medium angular blocky; friable; very few distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; very slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—37 to 42 inches; yellowish brown (10YR 5/4) silt loam with thin strata of fine sandy loam; weak fine prismatic structure; friable; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.

2C—42 to 60 inches; yellowish brown (10YR 5/4), stratified silt loam and fine sandy loam; massive; friable; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; strongly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches

Thickness of the silty material: 22 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 25 to 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bt horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—loam, silt loam, sandy loam, very fine sandy loam, or clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—stratified silt loam, loam, sandy loam, fine sandy loam, loamy fine sand, very fine sand, or the gravelly analogs of these textures

443B—Barrington silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Barrington and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a thinner surface layer
- Soils that contain sandy and gravelly deposits in the lower part of the profile
- Soils that have carbonates at a depth of more than 40 inches
- Soils that contain till in the lower part of the profile
- Soils that contain loamy outwash at a depth of more than 40 inches
- Soils that have a seasonal high water table at a depth of more than 3.5 feet or less than 2.0 feet

Dissimilar soils:
- The poorly drained Drummer and Thorp soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Barrington soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

848B—Drummer-Barrington-Mundelein complex, 1 to 6 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform:
Drummer—toeslopes and depressions
Barrington—summits, shoulders, and backslopes
Mundelein—footslopes

Soil Properties and Qualities

Drainage class:
Drummer—poorly drained
Barrington—moderately well drained
Mundelein—somewhat poorly drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Drummer and similar soils: 35 percent
Barrington and similar soils: 30 percent
Mundelein and similar soils: 30 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that contain sandy and gravelly deposits in the lower part of the profile
- Soils that contain till in the lower part of the profile
- Soils that have a thinner surface layer

Dissimilar soils:
- Loamy Orthents in positions on the landform similar to those of the major soils
- The very poorly drained Houghton, Muskego, and Peotone soils in depressions and drainageways

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Beecher Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Moraines and till plains
Parent material: Thin mantle of silty material and the underlying silty clay loam till
Slope range: 0 to 4 percent

Taxonomic classification: Fine, illitic, mesic Udollic Epiaqualfs

Typical Pedon for MLRA 110

Typical pedon of Beecher silt loam, 0 to 2 percent slopes, at an elevation of 655 feet, 340 feet south and 65 feet west of the northeast corner of sec. 14, T. 31 N., R. 12 E., in Kankakee County; USGS Bradley topographic quadrangle; lat. 41 degrees 10 minutes 39 seconds N. and long. 87 degrees 47 minutes 52 seconds W., NAD 27:

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine granular structure; friable; neutral; abrupt smooth boundary.

BE—9 to 13 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate very fine granular structure; friable; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine faint brown (10YR 5/3) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

2Bt1—13 to 16 inches; brown (10YR 5/3) silty clay loam; moderate very fine subangular blocky structure; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine black (10YR 2/1) iron and manganese oxide concretions throughout; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; moderately acid; clear smooth boundary.

2Bt2—16 to 21 inches; grayish brown (10YR 5/2) silty clay loam; moderate very fine and fine subangular blocky structure; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark gray (10YR 4/1) clay films on faces of peds; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; moderately acid; clear smooth boundary.

2Bt3—21 to 27 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium prismatic structure parting to moderate fine subangular blocky; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine dark brown (7.5YR 3/3) and black (10YR 2/1) iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; 2 percent gravel; slightly alkaline; clear smooth boundary.

2Bt4—27 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine black (10YR 2/1) iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/8) and distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium prominent gray (5Y 5/1) iron depletions in the matrix; 2 percent gravel; slightly alkaline; clear smooth boundary.

2BCt—32 to 37 inches; yellowish brown (10YR 5/6) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; few fine black (10YR 2/1) iron and manganese oxide concretions throughout; many coarse prominent gray (5Y 5/1) iron depletions in the matrix; 2 percent gravel; slightly effervescent; moderately alkaline; clear smooth boundary.

2Cd—37 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; massive; very firm; few fine black (10YR 2/1) iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/8) and distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine prominent greenish gray (5GY 5/1) iron depletions in the matrix; common medium prominent greenish gray (5G 6/1) iron depletions on cleavage planes; 5 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: Less than 18 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2
Texture—silt loam

2Bt or 2BCt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay

2Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam

298A—Beecher silt loam, 0 to 2 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Beecher and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a lighter colored surface layer
- Soils that have a thicker surface layer
- Soils that contain more sand in the upper one-half of the profile
- Soils that have a seasonal high water table at a depth of more than 2 feet
- Soils that have slopes of more than 2 percent

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Beecher soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

298B—Beecher silt loam, 2 to 4 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Summits, backslopes, and footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Beecher and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a lighter colored surface layer
- Soils that have a thicker surface layer
- Soils that are moderately eroded
- Soils that have a seasonal high water table at a depth of more than 2 feet
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that contain more sand in the upper one-half of the profile

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Beecher soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

854B—Markham-Ashkum-Beecher complex, 1 to 6 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform:
Markham—summits, shoulders, and backslopes
Ashkum—toeslopes and depressions
Beecher—summits, backslopes, and footslopes

Soil Properties and Qualities

Drainage class:
Markham—moderately well drained
Ashkum—poorly drained
Beecher—somewhat poorly drained
Parent material:
Markham—thin mantle of silty material and the underlying silty clay loam till
Ashkum—silty colluvium and the underlying silty clay loam till
Beecher—thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Markham and similar soils: 35 percent
Ashkum and similar soils: 30 percent
Beecher and similar soils: 30 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have a thicker surface layer
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that have a lighter colored surface layer
- Soils that contain less clay in the subsoil

Dissimilar soils:
- The very poorly drained Houghton, Muskego, and Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Blount Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Moraines and till plains
Parent material: Thin mantle of silty material and the underlying silty clay loam till
Slope range: 0 to 4 percent

Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon for MLRA 110

Typical pedon of Blount silt loam, 0 to 2 percent slopes, at an elevation of 705 feet, 2,480 feet south and 1,203 feet west of the northeast corner of sec. 29, T. 26 N., R. 6 E., in Livingston County; USGS Fairbury topographic quadrangle; lat. 40 degrees 41 minutes 39 seconds N. and long. 88 degrees 32 minutes 59 seconds W., NAD 27:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; few fine roots; moderately acid; abrupt smooth boundary.

E—7 to 13 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; moderate thin platy structure; friable; few fine roots; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; abrupt smooth boundary.
2Bt1—13 to 17 inches; brown (10YR 5/3) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; 3 percent gravel; moderately acid; clear smooth boundary.
2Bt2—17 to 26 inches; grayish brown (10YR 5/2) silty clay; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 3 percent gravel; slightly acid; clear smooth boundary.
2Bt3—26 to 32 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate medium prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common distinct gray (5Y 5/1) clay films on faces of peds; many medium prominent gray (5Y 6/1) iron depletions in the matrix; 3 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
2Cd—32 to 60 inches; 60 percent light olive brown (2.5Y 5/4) and 40 percent gray (5Y 6/1) silty clay loam; massive; very firm; common medium prominent white (10YR 8/1) calcium carbonate concretions throughout; 5 percent gravel; strongly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: Less than 18 inches
Depth to carbonates: 19 to 40 inches
Thickness of the solum: 20 to 48 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2
Texture—silt loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam or silty clay

2Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or clay loam

23A—Blount silt loam, 0 to 2 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Blount and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a darker surface layer
- Soils that contain more sand in the upper one-half of the profile
- Soils that have a seasonal high water table at a depth of more than 2 feet
- Soils that have slopes of more than 2 percent

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Blount soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

23B—Blount silt loam, 2 to 4 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Summits, backslopes, and footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Blount and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a darker surface layer
- Soils that contain more sand in the upper one-half of the profile
- Soils that are moderately eroded
- Soils that have a seasonal high water table at a depth of more than 2 feet
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Blount soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Bowes Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains, stream terraces, and kames
Parent material: Silty material and the underlying loamy and gravelly outwash
Slope range: 2 to 4 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Mollic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Bowes silt loam, 2 to 4 percent slopes, at an elevation of 760 feet, 1,500 feet south and 2,635 feet east of the northwest corner of sec. 8, T. 40 N., R. 9 E., in Du Page County; USGS West Chicago topographic quadrangle; lat. 41 degrees 58 minutes 8 seconds N. and long. 88 degrees 13 minutes 58 seconds W., NAD 27:

Ap—0 to 8 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; many very fine roots; moderately acid; abrupt smooth boundary.

E—8 to 12 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate thin platy structure; friable; common very fine roots; moderately acid; clear smooth boundary.

Bt1—12 to 17 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; few distinct dark brown (10YR 3/3) clay films on faces of peds and in pores; slightly acid; clear wavy boundary.

Bt2—17 to 27 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; slightly acid; gradual wavy boundary.

Bt3—27 to 37 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds and in pores; slightly acid; gradual wavy boundary.

2Bt4—37 to 43 inches; dark yellowish brown (10YR 4/4) gravelly clay loam; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2)

organo-clay films and brown (10YR 4/3) clay films on faces of peds and in pores; 15 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

2C—43 to 70 inches; yellowish brown (10YR 5/4) very gravelly loamy sand; single grain; loose; 35 percent gravel and 5 percent cobbles; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: 28 to 60 inches
Depth to sandy and gravelly deposits: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Thickness of the solum: 42 to 65 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 or 4
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 to 6
Texture—the gravelly or very gravelly analogs of clay loam, sandy clay loam, loam, sandy loam, or loamy sand
Content of gravel—15 to 60 percent

2C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—gravelly loamy sand to extremely gravelly coarse sand
Content of gravel—15 to 75 percent
Content of cobbles—5 to 35 percent

792B—Bowes silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains, stream terraces, and kames
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Silty material and the underlying loamy and gravelly outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Bowes and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a darker subsurface layer
- Soils that contain sandy and gravelly deposits at a depth of less than 40 inches or more than 60 inches
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that contain more sand in the upper and middle parts of the subsoil
- Soils that have a lighter colored surface layer

Dissimilar soils:
- The poorly drained Dunham soils in depressions and drainageways
- The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
- The loamy Fox soils in positions on the landform similar to those of the Bowes soil
- Loamy Orthents in positions on the landform similar to those of the Bowes soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Casco Series

Drainage class: Somewhat excessively drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Stream terraces, kames, outwash plains, and moraines

Parent material: Loamy drift over sandy and gravelly deposits
Slope range: 4 to 30 percent

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, superactive, mixed, mesic Inceptic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Casco loam, 6 to 12 percent slopes, eroded, at an elevation of 707 feet, 1,470 feet south and 300 feet west of the northeast corner of sec. 15, T. 39 N., R. 9 E., in Du Page County; USGS Naperville topographic quadrangle; lat. 41 degrees 52 minutes 3 seconds N. and long. 88 degrees 11 minutes 11 seconds W., NAD 27:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many very fine to medium roots; neutral; abrupt smooth boundary.
Bt1—8 to 11 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 2 percent gravel; neutral; clear smooth boundary.
Bt2—11 to 14 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium angular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; 6 percent gravel; very slightly effervescent; slightly alkaline; clear smooth boundary.
2Bt3—14 to 18 inches; brown (7.5YR 4/4) gravelly clay loam; weak coarse angular blocky structure; friable; common fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films and brown (10YR 4/3) clay films on faces of peds; 20 percent gravel; strongly effervescent; slightly alkaline; clear wavy boundary.
2C—18 to 60 inches; brown (7.5YR 4/4) very gravelly sand; single grain; loose; 50 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Depth to sandy and gravelly deposits: 10 to 20 inches
Depth to carbonates: 10 to 20 inches
Thickness of the solum: 10 to 20 inches

Ap or A horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—2 or 3
Texture—loam or silt loam

Bt or 2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—sandy clay loam, loam, clay loam, or the gravelly analogs of these textures
Content of gravel—0 to 35 percent

2C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 or 4
Texture—sand, coarse sand, or the gravelly, very gravelly, or extremely gravelly analogs of these textures
Content of gravel—10 to 70 percent

323C2—Casco loam, 4 to 6 percent slopes, eroded

Setting

Landform: Stream terraces, kames, outwash plains, and moraines
Position on the landform: Backslopes and shoulders

Soil Properties and Qualities

Drainage class: Somewhat excessively drained
Parent material: Loamy drift over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Casco and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are severely eroded
- Soils that contain sandy and gravelly deposits at a depth of more than 20 inches
- Soils that contain till in the lower part of the profile
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have a darker surface layer

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
- The excessively drained Rodman soils in positions on the landform similar to those of the Casco soil

• The poorly drained Dunham soils in depressions and drainageways
• Loamy Orthents in positions on the landform similar to those of the Casco soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Forestland" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

323D2—Casco loam, 6 to 12 percent slopes, eroded

Setting

Landform: Stream terraces, kames, outwash plains, and moraines
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Somewhat excessively drained
Parent material: Loamy drift over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Casco and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
• Soils that are severely eroded
• Soils that contain sandy and gravelly deposits at a depth of more than 20 inches
• Soils that have slopes of less than 6 percent or more than 12 percent
• Soils that contain till in the lower part of the profile

Dissimilar soils:
• The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
• The excessively drained Rodman soils in positions on the landform similar to those of the Casco soil
• The poorly drained Dunham soils in depressions and drainageways
• Loamy Orthents in positions on the landform similar to those of the Casco soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Forestland" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

969F—Casco-Rodman complex, 20 to 30 percent slopes

Setting

Landform: Stream terraces, kames, outwash plains, and moraines
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class:
Casco—somewhat excessively drained
Rodman—excessively drained
Parent material:
Casco—loamy drift over sandy and gravelly deposits
Rodman—gravelly drift

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Casco and similar soils: 45 percent
Rodman and similar soils: 40 percent
Dissimilar soils: 15 percent

Similar soils:
• Soils that have carbonates at or near the surface
• Soils that contain sandy and gravelly deposits at a depth of more than 20 inches
• Soils that have slopes of less than 20 percent or more than 30 percent
• Soils that are moderately eroded
• Soils that contain till in the lower part of the profile

Dissimilar soils:
• The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
• The poorly drained Dunham soils in depressions and drainageways
• Loamy Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Chenoa Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part; slow in the lower part
Landform: Moraines and till plains
Parent material: Silty material and the underlying silty clay loam till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Chenoa silty clay loam, 0 to 2 percent slopes, at an elevation of 692 feet, 100 feet south and 825 feet west of the northeast corner of sec. 2, T. 27 N., R. 3 E., in Livingston County; USGS Flanagan South topographic quadrangle; lat. 40 degrees 47 minutes 19 seconds N. and long. 88 degrees 50 minutes 14 seconds W., NAD 27:

Ap—0 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few fine roots; neutral; abrupt smooth boundary.

BA—12 to 16 inches; brown (10YR 4/3) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bt1—16 to 21 inches; brown (10YR 4/3) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct gray (10YR 5/1) iron depletions in the matrix; neutral; clear smooth boundary.

Bt2—21 to 26 inches; grayish brown (10YR 5/2) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; common medium black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint gray (10YR 5/1) iron depletions in the matrix; neutral; clear smooth boundary.

Bt3—26 to 32 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; friable; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; common medium black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint gray (10YR 5/1) iron depletions in the matrix; neutral; clear smooth boundary.

2Bt4—32 to 36 inches; light olive brown (2.5Y 5/4) silty clay loam; weak medium prismatic structure parting to weak medium angular blocky; firm; few very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common medium distinct gray (2.5Y 6/1) iron depletions in the matrix; 3 percent gravel; slightly alkaline; clear smooth boundary.

2C—36 to 60 inches; light olive brown (2.5Y 5/4) silty clay loam; massive; firm; few prominent light brownish gray (10YR 6/2) coatings on vertical cleavage planes; common medium distinct gray (2.5Y 6/1) iron depletions in the matrix; 3 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the silty material: 20 to 40 inches
Depth to carbonates: 25 to 45 inches
Thickness of the solum: 25 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam or silt loam

Bt or BA horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silty clay

2Bt horizon:
Hue—10YR or 2.5Y

Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silt loam

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silt loam

614A—Chenoa silty clay loam, 0 to 2 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Chenoa and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a thinner surface layer
- Soils that contain silty clay loam till at a depth of less than 20 inches or more than 40 inches
- Soils that contain more silt and less clay in the subsoil
- Soils that contain more sand in the upper one-half of the profile
- Soils that have carbonates at a depth of more than 45 inches
- Soils that have a seasonal high water table at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Chenoa soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Del Rey Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon for MLRA 110

Typical pedon of Del Rey silt loam, 0 to 2 percent slopes, at an elevation of 662 feet, 155 feet south and 1,200 feet west of the northeast corner of sec. 1, T. 25 N., R. 11 E., in Iroquois County; USGS Onarga West topographic quadrangle; lat. 40 degrees 40 minutes 43 seconds N. and long. 88 degrees 0 minutes 12 seconds W., NAD 27:

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

E—4 to 9 inches; light brownish gray (10YR 6/2) silt loam, light gray (10YR 7/2) dry; moderate thin and medium platy structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

Bt—9 to 12 inches; brown (10YR 5/3) silty clay loam; strong fine subangular blocky structure; firm; common fine roots; many distinct pale brown (10YR 6/3 dry) clay depletions and grayish brown (10YR 5/2) clay films on faces of peds; very strongly acid; clear smooth boundary.

Btg1—12 to 25 inches; light brownish gray (2.5Y 6/2) silty clay; strong fine and medium subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; very strongly acid; clear smooth boundary.

Btg2—25 to 33 inches; 50 percent light brownish gray (2.5Y 6/2), 30 percent light olive brown (2.5Y 5/4), and 20 percent gray (10YR 6/1) silty clay; moderate fine and medium angular and subangular blocky structure; firm; common fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; strongly acid; gradual smooth boundary.

BCtg—33 to 41 inches; 35 percent light brownish gray (2.5Y 6/2), 35 percent gray (10YR 6/1), and 30 percent light olive brown (2.5Y 5/4) silty clay loam; weak coarse angular and subangular blocky structure; firm; few fine roots; common distinct grayish brown (2.5Y 5/2) clay films on vertical faces of peds; slightly alkaline; gradual smooth boundary.

Cg—41 to 60 inches; 55 percent grayish brown (10YR 5/2) and 45 percent yellowish brown (10YR 5/6 and 5/8) silty clay loam; massive; friable; few distinct light gray (10YR 7/1 dry) clay depletions on bedding planes; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Depth to carbonates: 30 to 48 inches
Thickness of the solum: 24 to 48 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam or silty clay loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Bt, Btg, or BCtg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silty clay

C or Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—silt loam or silty clay loam

192A—Del Rey silt loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Lacustrine deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Del Rey and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that contain less clay in the subsoil
- Soils that contain more gravel in the profile
- Soils that have a thicker and darker surface layer
- Soils that have a seasonal high water table at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Milford soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Del Rey soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Drummer Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains, stream terraces, and till plains
Parent material: Silty material and the underlying loamy outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Drummer silty clay loam, 0 to 2 percent slopes, at an elevation of 735 feet, 1,400 feet south and 200 feet east of the northwest corner of sec. 2, T. 25 N., R. 6 E., in Livingston County; USGS Forrest South topographic quadrangle; lat. 40 degrees 40 minutes 4 seconds N. and long. 88 degrees 29 minutes 47 seconds W., NAD 27:

Ap—0 to 10 inches; black (10YR 2/1) silty clay loam,

dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

A—10 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

BAg—14 to 18 inches; dark gray (10YR 4/1) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bg—18 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct light grayish brown (2.5Y 6/2) iron depletions in the matrix; neutral; clear smooth boundary.

Btg1—24 to 30 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine prismatic structure parting to moderate medium angular blocky; friable; few very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; neutral; clear smooth boundary.

Btg2—30 to 42 inches; grayish brown (2.5Y 5/2) silt loam; moderate medium prismatic structure parting to moderate medium angular blocky; friable; few very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; neutral; clear smooth boundary.

2Btg3—42 to 50 inches; grayish brown (2.5Y 5/2), stratified silt loam and loam; weak coarse prismatic structure; friable; few very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 2 percent gravel; neutral; clear smooth boundary.

2Cg—50 to 60 inches; light brownish gray (2.5Y 6/2), stratified silt loam and loam; massive; friable; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; very slightly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the silty material: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Thickness of the solum: 42 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam or silt loam

Bg, Btg, or BAg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—1 or 2
Texture—silty clay loam or silt loam

2Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—loam, silt loam, sandy loam, sandy clay loam, or clay loam

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—loam, silt loam, sandy loam, or loamy sand

152A—Drummer silty clay loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains, stream terraces, and till plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Drummer and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have no subsurface layer
- Soils that contain more sand in the middle part of the subsoil
- Soils that have carbonates at a depth of less than 40 inches
- Soils that contain sandy and gravelly deposits in the lower part of the profile

Dissimilar soils:
- The moderately well drained Barrington and somewhat poorly drained Mundelein soils in the higher positions on the landform
- The very poorly drained Houghton and Muskego soils in depressions
- Loamy Orthents in positions on the landform similar to those of the Drummer soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

848B—Drummer-Barrington-Mundelein complex, 1 to 6 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform:
Drummer—toeslopes and depressions
Barrington—summits, shoulders, and backslopes
Mundelein—footslopes

Soil Properties and Qualities

Drainage class:
Drummer—poorly drained
Barrington—moderately well drained
Mundelein—somewhat poorly drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Drummer and similar soils: 35 percent
Barrington and similar soils: 30 percent
Mundelein and similar soils: 30 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that contain sandy and gravelly deposits in the lower part of the profile
- Soils that contain till in the lower part of the profile
- Soils that have a thinner surface layer

Dissimilar soils:
- Loamy Orthents in positions on the landform similar to those of the major soils
- The very poorly drained Houghton, Muskego, and Peotone soils in depressions and drainageways

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

1152A—Drummer silty clay loam, undrained, 0 to 2 percent slopes

Setting

Landform: Outwash plains, stream terraces, and till plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Drummer and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have no subsurface layer
- Soils that contain more sand in the middle part of the subsoil
- Soils that have carbonates at a depth of less than 40 inches
- Soils that contain sandy and gravelly deposits in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Mundelein soils in the slightly higher positions on the landform
- The very poorly drained Houghton and Muskego soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Dunham Series

Drainage class: Poorly drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Silty material and the underlying loamy outwash over sandy and gravelly deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Dunham silty clay loam, 0 to 2 percent slopes, at an elevation of 690 feet, 1,060 feet south and 2,360 feet east of the northwest corner of sec. 11, T. 38 N., R. 9 E., in Du Page County; USGS Naperville topographic quadrangle; lat. 41 degrees 47 minutes 49 seconds N. and long. 88 degrees 10 minutes 40 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; many very fine roots; neutral; clear smooth boundary.

A—7 to 11 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; friable; common very fine roots; common fine distinct brown (10YR 4/3) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Btg1—11 to 15 inches; dark grayish brown (2.5Y 4/2) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common fine prominent brown (10YR 5/3) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Btg2—15 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak medium prismatic structure parting to moderate fine and medium angular blocky; friable; few very fine roots; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common black (2.5Y 2.5/1) krotovinas; many fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; neutral; clear smooth boundary.

Bg1—24 to 31 inches; gray (2.5Y 5/1) silty clay loam; weak medium prismatic structure parting to weak medium angular blocky; friable; few very fine roots; common very dark gray (2.5Y 3/1) krotovinas; common fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct gray (5Y 6/1) iron depletions in the matrix; neutral; clear wavy boundary.

2Bg2—31 to 35 inches; gray (2.5Y 5/1) clay loam; weak medium subangular blocky structure; friable; few very fine roots; common very dark gray (2.5Y 3/1) krotovinas; common fine distinct light olive brown (2.5Y 5/3) masses of iron accumulation in the matrix; common fine distinct gray (5Y 6/1) iron depletions in the matrix; 12 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2BCg—35 to 42 inches; grayish brown (2.5Y 5/2), stratified gravelly loam and gravelly sandy loam; weak coarse subangular blocky structure; friable; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; 18 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

3C—42 to 60 inches; brown (10YR 5/3) very gravelly loamy sand; massive; very friable; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; 50 percent gravel; slightly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the silty material: 24 to 50 inches
Depth to sandy and gravelly deposits: 32 to 55 inches
Depth to carbonates: 30 to 50 inches
Thickness of the solum: 36 to 55 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam or silt loam

Btg or Bg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam or silt loam

2Bg or 2BCg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—5 or 6
Chroma—0 to 2
Texture—loam, clay loam, silt loam, sandy loam, or the gravelly analogs of these textures
Content of gravel—0 to 20 percent

3C horizon:
Hue—7.5YR, 10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 8
Texture—gravelly sandy loam to extremely gravelly coarse sand
Content of gravel—15 to 70 percent

523A—Dunham silty clay loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Silty material and the underlying loamy outwash over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Dunham and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that contain less sand and more clay in lower part of the profile
- Soils that have no subsurface layer
- Soils that contain more sand in the upper one-half of the subsoil
- Soils that contain sandy and gravelly deposits at a depth of less than 32 inches or more than 55 inches
- Soils that have carbonates at a depth of more than 50 inches

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils in the higher positions on the landform
- The very poorly drained Houghton and Muskego soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Dunham soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

1523A—Dunham silty clay loam, undrained, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Silty material and the underlying loamy outwash over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Dunham and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that contain less sand and more clay in the lower part of the profile
- Soils that have no subsurface layer
- Soils that contain more sand in the upper one-half of the subsoil
- Soils that contain sandy and gravelly deposits at a depth of less than 32 inches or more than 55 inches
- Soils that have carbonates at a depth of more than 50 inches

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils in the higher positions on the landform
- The very poorly drained Houghton and Muskego soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Elliott Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Moraines and till plains
Parent material: Thin mantle of silty material and the underlying silty clay loam till
Slope range: 0 to 4 percent

Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Elliott silt loam, 0 to 2 percent slopes, at an elevation of 704 feet, 690 feet south and 2,436 feet west of the center of sec. 21, T. 29 N., R. 8 E., in Livingston County; USGS Cullom topographic quadrangle; lat. 40 degrees 58 minutes 11 seconds N. and long. 88 degrees 19 minutes 58 seconds W., NAD 27:

Ap—0 to 6 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

A—6 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common fine roots; slightly acid; clear smooth boundary.

Bt1—11 to 16 inches; light olive brown (2.5Y 5/4) silty clay; moderate fine subangular blocky structure; friable; common fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; neutral; clear smooth boundary.

2Bt2—16 to 23 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.

2Bt3—23 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; neutral; clear smooth boundary.

2Bt4—28 to 35 inches; olive brown (2.5Y 4/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium white (10YR 8/1) calcium carbonate concretions throughout; 1 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Bt5—35 to 41 inches; olive brown (2.5Y 4/4) silty clay loam; weak fine prismatic structure parting to moderate medium angular blocky; firm; few fine roots; common distinct gray (5Y 6/1) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; strongly effervescent; slightly alkaline; clear smooth boundary.

2Cd—41 to 60 inches; olive brown (2.5Y 4/4) silty clay loam; massive; very firm; common fine prominent gray (5Y 5/1) iron depletions in the matrix; 3 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the silty material: Less than 20 inches
Depth to carbonates: 17 to 40 inches
Thickness of the solum: 20 to 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay

2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam

146A—Elliott silt loam, 0 to 2 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Elliott and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a seasonal high water table at a depth of more than 2 feet
- Soils that have a thinner subsurface layer
- Soils that contain more sand in the upper one-half of the profile
- Soils that contain less clay and more silt in the upper one-half of the profile
- Soils that have slopes of more than 2 percent

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Elliott soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

146B—Elliott silt loam, 2 to 4 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Summits, backslopes, and footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Elliott and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a seasonal high water table at a depth of more than 2 feet
- Soils that contain more sand in the upper one-half of the profile
- Soils that have a thinner subsurface layer
- Soils that are moderately eroded
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that contain less clay and more silt in the upper one-half of the profile

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways

• Clayey Orthents in positions on the landform similar to those of the Elliott soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

Faxon Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Terraces
Parent material: Glacial drift over bedrock
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Faxon silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded, at an elevation of 519 feet, 30 feet north and 1,320 feet east of the center of sec. 35, T. 34 N., R. 8 E., in Grundy County; USGS Minooka topographic quadrangle; lat. 41 degrees 23 minutes 3 seconds N. and long. 88 degrees 16 minutes 24 seconds W., NAD 27:

Ap—0 to 9 inches; black (N 2.5/0) silty clay loam, dark gray (N 4/0) dry; moderate medium granular structure; friable; common very fine roots; slightly alkaline; clear smooth boundary.
A—9 to 19 inches; black (N 2.5/0) silty clay loam, gray (N 5/0) dry; weak coarse subangular blocky structure; firm; common very fine roots; slightly alkaline; gradual smooth boundary.
2Bg1—19 to 27 inches; dark gray (5Y 4/1) clay loam; weak coarse prismatic structure; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine prominent light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.
2Bg2—27 to 34 inches; gray (5Y 5/1) clay loam; moderate medium prismatic structure; firm; few very fine roots; common fine prominent olive yellow (2.5Y 6/6) masses of iron accumulation in the matrix; 12 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
3R—34 inches; limestone bedrock.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: More than 12 inches
Depth to bedrock: 20 to 40 inches
Thickness of the solum: 20 to 40 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 or 3
Chroma—0 or 1
Texture—loam, silt loam, clay loam, or silty clay loam

2Bg horizon:
Hue—10YR, 2.5Y, 5Y, or 5GY
Value—4 or 5
Chroma—1 to 4
Texture—clay loam, silty clay loam, loam, silt loam, or sandy loam

1516A—Faxon silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Footslopes and toeslopes

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Glacial drift over bedrock

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Faxon and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
• Soils that are overlain by recent, light-colored deposition
• Soils that have no subsurface layer
• Soils that contain bedrock at a depth of less than 20 inches or more than 40 inches

Dissimilar soils:
• The very deep Sawmill and very shallow Romeo soils in positions on the landform similar to those of the Faxon soil
• Loamy Orthents in positions on the landform similar to those of the Faxon soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Fox Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Stream terraces, kames, outwash plains, and moraines
Parent material: Loamy drift over sandy and gravelly deposits
Slope range: 2 to 6 percent

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Fox silt loam, 2 to 4 percent slopes, at an elevation of 709 feet, 960 feet north and 2,740 feet west of the southeast corner of sec. 22, T. 39 N., R. 9 E., in Du Page County; USGS Naperville topographic quadrangle; lat. 41 degrees 50 minutes 41 seconds N. and long. 88 degrees 11 minutes 46 seconds W., NAD 27:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate very fine and fine granular structure; friable; many very fine roots; neutral; abrupt smooth boundary.
BE—7 to 10 inches; brown (10YR 5/3) loam; weak medium platy structure parting to moderate fine granular; friable; common very fine roots; few distinct dark grayish brown (10YR 4/2) coatings on faces of peds; 8 percent gravel; neutral; clear smooth boundary.
Bt1—10 to 16 inches; brown (7.5YR 4/4) clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct brown (7.5YR 4/3) clay films on faces of peds; 10 percent gravel; slightly acid; gradual smooth boundary.
Bt2—16 to 26 inches; brown (7.5YR 4/4) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; many distinct brown (7.5YR 4/3) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; 12 percent gravel; neutral; abrupt smooth boundary.
2BC—26 to 32 inches; dark yellowish brown (10YR 4/4) very gravelly sandy clay loam; weak medium subangular blocky structure; very friable; few very fine roots; 40 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
2C—32 to 80 inches; yellowish brown (10YR 5/4) extremely gravelly coarse sand; single grain; loose; few very fine roots; 60 percent gravel and 5 percent cobbles; slightly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Depth to sandy and gravelly deposits: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 40 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam or loam

Bt or 2BC horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—3 or 4
Texture—clay loam, silty clay loam, loam, sandy clay loam, sandy loam, or the gravelly or very gravelly analogs of these textures
Content of gravel—0 to 45 percent

2C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 or 4
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand or coarse sand
Content of gravel—15 to 70 percent

327B—Fox silt loam, 2 to 4 percent slopes

Setting

Landform: Stream terraces, kames, outwash plains, and moraines
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loamy drift over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this

section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Fox and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a darker surface layer
- Soils that contain sandy and gravelly deposits at a depth of more than 40 inches or less than 20 inches
- Soils that contain less sand and more silt in the lower one-half of the profile
- Soils that contain till in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
- The poorly drained Dunham soils in depressions and drainageways
- The excessively drained Rodman soils in the slightly higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Fox soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

327C2—Fox silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Stream terraces, kames, outwash plains, and moraines
Position on the landform: Backslopes and shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loamy drift over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Fox and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a darker surface layer
- Soils that contain less sand and more silt in the lower one-half of the profile
- Soils that contain till in the lower part of the profile
- Soils that have slopes of less than 4 percent or more than 6 percent

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
- The poorly drained Dunham soils in depressions and drainageways
- The excessively drained Rodman soils in the slightly higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Fox soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Graymont Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part; slow in the lower part
Landform: Moraines and till plains
Parent material: Silty material and the underlying silty clay loam till
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Graymont silt loam, 2 to 5 percent slopes, at an elevation of 704 feet, 2,100 feet north and 100 feet east of the southwest corner of sec. 28, T. 28 N., R. 3 E., in Livingston County; USGS Flanagan Southwest topographic quadrangle; lat. 40 degrees 51

minutes 40 seconds N. and long. 88 degrees 53 minutes 30 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

AB—7 to 12 inches; very dark brown (10YR 2/2) silt loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate fine angular blocky; friable; few very fine roots; slightly acid; clear smooth boundary.

Bt1—12 to 19 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine angular blocky structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—19 to 24 inches; yellowish brown (10YR 5/4 and 5/6) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3—24 to 28 inches; yellowish brown (10YR 5/4 and 10YR 5/6) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

Bt4—28 to 33 inches; brown (10YR 5/3) silt loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; neutral; clear smooth boundary.

2Btg—33 to 38 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine prismatic structure; firm; few very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; 3 percent gravel; neutral; clear smooth boundary.

2Cg—38 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; few fine black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; few fine prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; few fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; few fine white (10YR 8/1) calcium carbonate concretions throughout; 3 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the silty material: 20 to 40 inches
Depth to carbonates: 24 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam, silt loam, or silty clay

2Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam, silt loam, or silty clay

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silt loam

541B—Graymont silt loam, 2 to 5 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this

section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Graymont and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have no subsurface layer
- Soils that contain silty clay loam till at a depth of less than 20 inches or more than 40 inches
- Soils that contain more sand in the upper one-half of the profile
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have slopes of less than 2 percent or more than 5 percent

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Graymont soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Grays Series

Drainage class: Moderately well drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Silty material and the underlying loamy outwash
Slope range: 2 to 4 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Grays silt loam, 2 to 4 percent slopes, at an elevation of 790 feet, 575 feet north and 1,645 feet east of the southwest corner of sec. 14, T. 45 N., R. 10 E., in Lake County; USGS Grayslake topographic quadrangle; lat. 42 degrees 22 minutes 23 seconds N. and long. 88 degrees 22 minutes 14 seconds W., NAD 27:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; common very fine roots; slightly acid; gradual wavy boundary.

BE—8 to 11 inches; 70 percent dark yellowish brown (10YR 4/4) and 30 percent brown (10YR 4/3) silt loam; weak very fine and fine subangular blocky structure; friable; common very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) and few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bt1—11 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common distinct dark brown (10YR 3/3) clay films on faces of peds; neutral; gradual wavy boundary.

Bt2—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds and in pores; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual wavy boundary.

Bt3—24 to 34 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores; common distinct brown (10YR 4/3) clay films on faces of peds; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; slightly alkaline; clear wavy boundary.

2Bt4—34 to 42 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; common very fine roots; few distinct brown (10YR 5/3) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

2C1—42 to 50 inches; yellowish brown (10YR 5/4) loam; massive; friable; common medium prominent strong brown (7.5YR 4/6) and common medium faint light yellowish brown (10YR 6/4) masses of iron accumulation in the matrix;

common medium and coarse distinct grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) iron depletions in the matrix; 4 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C2—50 to 60 inches; yellowish brown (10YR 5/4), stratified loam and sandy loam; massive; very friable; common medium prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; 6 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: 22 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bt or BE horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—stratified silt loam, loam, sandy loam, or loamy fine sand
Content of gravel—0 to 10 percent

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—stratified silt loam to very fine sand
Content of gravel—0 to 15 percent

698B—Grays silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Grays and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a thicker surface layer
- Soils that have carbonates at a depth of less than 20 inches or more than 40 inches
- Soils that contain till in the lower part of the profile
- Soils that have a lighter colored surface layer
- Soils that contain loamy outwash at a depth of more than 40 inches
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Drummer and Thorp soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Grays soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Grundelein Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Silty material and the underlying loamy outwash over sandy and gravelly deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Grundelein silt loam, 0 to 2 percent slopes, at an elevation of 765 feet, 340 feet south and 2,200 feet east of the northwest corner of sec. 20, T. 40 N., R. 9 E., in Du Page County; USGS West

Chicago topographic quadrangle; lat. 41 degrees 56 minutes 12 seconds N. and long. 88 degrees 14 minutes 2 seconds W., NAD 27:

Ap—0 to 8 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common very fine roots; slightly acid; clear smooth boundary.

A—8 to 13 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to moderate fine granular; friable; common very fine roots; neutral; abrupt smooth boundary.

Bt1—13 to 18 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct very dark gray (10YR 3/1) organic coatings and very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt2—18 to 25 inches; olive brown (2.5Y 4/3) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; few distinct very dark grayish brown (2.5Y 3/2) organo-clay films on faces of peds; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine prominent gray (10YR 5/1) iron depletions in the matrix; neutral; clear smooth boundary.

Bt3—25 to 29 inches; light olive brown (2.5Y 5/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

2Bt4—29 to 35 inches; light olive brown (2.5Y 5/3) silt loam; moderate medium subangular blocky structure; friable; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 2 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—35 to 43 inches; light olive brown (2.5Y 5/3) sandy loam; weak medium and coarse subangular blocky structure; very friable; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 4 percent gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

3C—43 to 80 inches; brown (10YR 4/3) very gravelly loamy sand; single grain; loose; 55 percent gravel; violently effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the silty material: 24 to 45 inches
Depth to sandy and gravelly deposits: 32 to 50 inches
Depth to carbonates: 27 to 50 inches
Thickness of the solum: 36 to 50 inches

Ap or A horizon:
- Hue—10YR
- Value—2 or 3
- Chroma—1 to 3
- Texture—silt loam

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4 to 6
- Chroma—2 to 4
- Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
- Hue—10YR or 2.5Y
- Value—4 to 6
- Chroma—2 to 6
- Texture—loam, clay loam, silt loam, sandy loam, or the gravelly analogs of these textures
- Content of gravel—0 to 20 percent

3C horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—4 to 6
- Chroma—1 to 8
- Texture—gravelly sandy loam to extremely gravelly coarse sand
- Content of gravel—15 to 70 percent

526A—Grundelein silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Silty material and the underlying loamy outwash over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Grundelein and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have no subsurface layer
- Soils that contain more sand in the upper one-half of the subsoil
- Soils that contain sandy and gravelly deposits at a depth of less than 32 inches or more than 50 inches
- Soils that have carbonates at a depth of more than 50 inches
- Soils that contain less sand and more clay in the lower part of the profile

Dissimilar soils:
- The poorly drained Dunham soils and the very poorly drained Houghton and Muskego soils in depressions and drainageways
- The well drained Bowes and Waupecan soils in the higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Grundelein soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Harpster Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Till plains and outwash plains
Parent material: Calcareous drift
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Calciaquolls

Typical Pedon for MLRA 110

Typical pedon of Harpster silt clay loam, 0 to 2 percent slopes, at an elevation of 722 feet, 855 feet south and 70 feet west of the northeast corner of sec. 20, T. 23 N., R. 7 E., in Ford County; USGS Gibson City West topographic quadrangle; lat. 40 degrees 26 minutes 24 seconds N. and long. 88 degrees 25 minutes 23 seconds W., NAD 27:

Apk—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; many snail shells; strongly effervescent (20 percent calcium carbonate); moderately alkaline; abrupt smooth boundary.

Ak—9 to 18 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine and medium granular structure; firm; common very fine roots; many snail shells; strongly effervescent (18 percent calcium carbonate); moderately alkaline; clear smooth boundary.

Bg1—18 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak fine and medium angular blocky structure; firm; common very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few snail shells; common fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; slightly effervescent (7 percent calcium carbonate); moderately alkaline; gradual smooth boundary.

Bg2—25 to 31 inches; dark gray (5Y 4/1) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium angular blocky; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few snail shells; few fine prominent dark yellowish brown (10YR 4/4) and few fine distinct olive (5Y 4/4) masses of iron accumulation in the matrix; slightly effervescent (5 percent calcium carbonate); slightly alkaline; gradual smooth boundary.

Bg3—31 to 36 inches; dark gray (5Y 4/1) silty clay loam; weak coarse prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common medium distinct olive (5Y 4/4) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; slightly effervescent (2 percent calcium carbonate); slightly alkaline; gradual smooth boundary.

Bg4—36 to 41 inches; 40 percent olive brown (2.5Y 4/4), 35 percent olive yellow (2.5Y 6/6), and 25 percent gray (5Y 5/1) silty clay loam; weak coarse angular blocky structure; firm; few very fine roots; 2 percent gravel; slightly effervescent (2 percent calcium carbonate); slightly alkaline; gradual smooth boundary.

Cg1—41 to 56 inches; 55 percent gray (5Y 5/1), 40 percent light olive brown (2.5Y 5/6), and 5 percent dark yellowish brown (10YR 4/4) silt loam; massive; firm; 1 percent gravel; strongly effervescent (16 percent calcium carbonate); moderately alkaline; clear smooth boundary.

Cg2—56 to 60 inches; gray (10YR 5/1) loam; massive; friable; 5 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 22 inches
Thickness of the silty material: 30 to 60 inches
Depth to carbonates: Less than 10 inches
Thickness of the solum: 22 to 46 inches

Apk or Ak horizon:
Hue—10YR, 2.5Y, or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam or silt loam

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam, silt loam, loam, or clay loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 4
Texture—silt loam, loam, sandy loam, or clay loam

67A—Harpster silty clay loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and till plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Calcareous drift

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Harpster and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that contain more sand in the subsoil
- Soils that contain more gravel in the lower part of the profile
- Soils that are darker in the upper part of the subsoil
- Soils that do not have carbonates at or near the surface

Dissimilar soils:
- The very poorly drained Houghton and Muskego soils in depressions
- The somewhat poorly drained Mundelein and Wauconda soils in the higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Harpster soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Houghton Series

Drainage class: Very poorly drained
Permeability: Moderate
Landform: Till plains, outwash plains, and lake plains

Parent material: Herbaceous organic material
Slope range: 0 to 2 percent

Taxonomic classification: Euic, mesic Typic Haplosaprists

Typical Pedon for MLRA 110

Typical pedon of Houghton muck, ponded, 0 to 2 percent slopes, at an elevation of 706 feet, 525 feet north and 1,620 feet east of the southwest corner of sec. 32, T. 26 N., R. 8 E., in Livingston County; USGS Chatsworth South topographic quadrangle; lat. 40 degrees 30 minutes 0 seconds N. and long. 88 degrees 19 minutes 36 seconds W., NAD 27:

Oa1—0 to 10 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed, dark gray (10YR 4/1) dry; about 15 percent fiber, 5 percent rubbed; weak fine subangular blocky structure; very friable; few very fine roots; neutral; clear smooth boundary.
Oa2—10 to 19 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; about 15 percent fiber, 5 percent rubbed; weak fine prismatic structure; very friable; few very fine roots; neutral; clear smooth boundary.
Oa3—19 to 27 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; about 15 percent fiber, 5 percent rubbed; weak fine prismatic structure; very friable; many fine roots; slightly acid; clear smooth boundary.
Oa4—27 to 36 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; about 15 percent fiber, 5 percent rubbed; massive; very friable; few very fine roots; slightly acid; clear smooth boundary.
Oa5—36 to 60 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; about 15 percent fiber, 5 percent rubbed; massive; very friable; few very fine roots; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the organic deposits: More than 51 inches

Surface tier:
Hue—7.5YR, 10YR, or neutral
Value—2 or 3
Chroma—0 or 1

Subsurface tier:
Hue—7.5YR, 10YR, or neutral
Value—2 or 3
Chroma—0 to 2

903A—Muskego and Houghton mucks, 0 to 2 percent slopes

Setting

Landform: Till plains, outwash plains, and lake plains
Position on the landform: Depressions

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material:
Muskego—herbaceous organic material over coprogenous deposits
Houghton—herbaceous organic material

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Muskego and similar soils: 50 percent
Houghton and similar soils: 40 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have organic deposits less than 51 inches thick
- Soils that have carbonates at or near the surface
- Soils that have less organic matter in the surface layer
- Soils that are lighter colored in the lower one-half of the profile

Dissimilar soils:
- The poorly drained Drummer, Dunham, and Milford soils in the slightly higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

1903A—Muskego and Houghton mucks, undrained, 0 to 2 percent slopes

Setting

Landform: Till plains, outwash plains, and lake plains
Position on the landform: Depressions

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material:
Muskego—herbaceous organic material over coprogenous deposits
Houghton—herbaceous organic material

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Muskego and similar soils: 50 percent
Houghton and similar soils: 40 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have organic deposits less than 51 inches thick
- Soils that have less organic matter in the surface layer
- Soils that have carbonates at or near the surface
- Soils that are lighter colored in the lower one-half of the profile

Dissimilar soils:
- The poorly drained Drummer, Dunham, and Milford soils in the slightly higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Kankakee Series

Drainage class: Well drained
Permeability: Moderate in the upper part; moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loamy outwash and the underlying cobbly deposits
Slope range: 2 to 4 percent

Taxonomic classification: Loamy-skeletal, mixed, superactive, mesic Typic Hapludolls

Typical Pedon for MLRA 110

Typical pedon of Kankakee fine sandy loam, 0 to 2 percent slopes, at an elevation of 635 feet, 1,660 feet north and 216 feet east of the southwest corner of sec. 36, T. 31 N., R. 10 E., in Kankakee County; USGS Herscher topographic quadrangle; lat. 41 degrees 7 minutes 21 seconds N. and long. 88 degrees 1 minute 44 seconds W., NAD 27:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many very fine roots; neutral; abrupt smooth boundary.
A—7 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many very fine roots; moderately acid; clear smooth boundary.
AB—10 to 14 inches; dark brown (10YR 3/3) fine sandy loam, brown (10YR 5/3) dry; moderate fine and medium subangular blocky structure; friable; many very fine and fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.
Bt1—14 to 22 inches; yellowish brown (10YR 5/4) sandy clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; many distinct brown (10YR 4/3) clay films on faces of peds; 3 percent gravel; slightly acid; gradual wavy boundary.
2Bt2—22 to 27 inches; dark yellowish brown (10YR 4/4) very cobbly loam; weak fine subangular blocky structure; friable; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 25 percent cobbles and 15 percent gravel; neutral; gradual wavy boundary.
2C—27 to 80 inches; dark yellowish brown (10YR 4/4) very cobbly loam; massive; friable; common very fine and fine roots; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 40 percent cobbles and 20 percent gravel; strongly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 7 to 18 inches
Depth to cobbles: 10 to 30 inches
Depth to carbonates: 12 to 30 inches
Thickness of the solum: 20 to 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—fine sandy loam, sandy loam, or loam

Bt or 2Bt horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 8
Texture—loam, sandy loam, clay loam, sandy clay loam, or the cobbly or very cobbly analogs of these textures
Content of cobbles—0 to 60 percent

2C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—the cobbly, very cobbly, or extremely cobbly analogs of sandy loam or loam
Content of cobbles—20 to 70 percent

494B—Kankakee fine sandy loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loamy outwash and the underlying cobbly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Kankakee and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have no subsurface layer
- Soils that have carbonates at a depth of more than 30 inches
- Soils that contain fewer cobbles in the lower part of the profile
- Soils that contain less clay and more sand in the lower one-half of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein soils in the lower positions on the landform
- The poorly drained Dunham soils in depressions and drainageways
- Loamy and stony Orthents in positions on the landform similar to those of the Kankakee soil
- Rockton soils, which are moderately deep to bedrock; in positions on the landform similar to those of the Kankakee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

830—Landfills

Description

This unit consists of garbage and other refuse and rubble from the demolition of buildings and pavement. These materials are typically covered by a layer of compacted earth. Slopes are highly variable. Some of the landfills are active, but some have been abandoned.

Management

Some inactive landfills are being developed as recreational areas.

Lorenzo Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Stream terraces, kames, outwash plains, and moraines
Parent material: Loamy drift over sandy and gravelly deposits
Slope range: 4 to 12 percent

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, active, mixed, mesic Typic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Lorenzo loam, 2 to 4 percent slopes, at an elevation of 510 feet, 320 feet south and 1,720 feet west of the northeast corner of sec. 35, T. 33 N., R. 5 E., in La Salle County; USGS Seneca topographic quadrangle; lat. 41 degrees 17 minutes 47 seconds N. and long. 88 degrees 37 minutes 3 seconds W., NAD 27:

Ap—0 to 6 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; friable; neutral; common very fine roots; clear smooth boundary.
AB—6 to 9 inches; dark brown (7.5YR 3/2) loam, brown (7.5YR 5/2) dry; weak medium angular blocky structure; friable; neutral; clear smooth boundary.
Bt1—9 to 16 inches; brown (7.5YR 4/4) clay loam; weak medium and coarse angular blocky structure; firm; common distinct dark brown (7.5YR 3/2) organo-clay films on faces of peds; 3 percent gravel; slightly acid; abrupt smooth boundary.
2Bt2—16 to 18 inches; brown (7.5YR 4/4) gravelly loam; very weak coarse subangular blocky structure; very friable; few distinct dark brown (7.5YR 3/2) organo-clay films on faces of peds; 20 percent gravel; slightly alkaline; abrupt smooth boundary.
2C—18 to 60 inches; yellowish brown (10YR 5/4) extremely gravelly sand; single grain; loose; 70 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 6 to 15 inches
Depth to sandy and gravelly deposits: 12 to 24 inches
Depth to carbonates: 12 to 24 inches
Thickness of the solum: 12 to 24 inches

Ap or AB horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam, silt loam, or sandy loam

Bt or 2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—clay loam, loam, sandy clay loam, or the gravelly analogs of these textures
Content of gravel—2 to 35 percent

2C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, coarse sand, or loamy coarse sand
Content of gravel—20 to 75 percent

318C2—Lorenzo loam, 4 to 6 percent slopes, eroded

Setting

Landform: Stream terraces, kames, outwash plains, and moraines
Position on the landform: Backslopes and shoulders

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loamy drift over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Lorenzo and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a lighter colored subsurface layer
- Soils that contain sandy and gravelly deposits at a depth of more than 24 inches
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that contain till in the lower part of the profile

Dissimilar soils:
- The excessively drained Rodman soils in the higher positions on the landform
- The poorly drained Dunham soils in depressions and drainageways
- The somewhat poorly drained Grundelein soils in the lower positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Lorenzo soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

318D2—Lorenzo loam, 6 to 12 percent slopes, eroded

Setting

Landform: Stream terraces, kames, outwash plains, and moraines
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loamy drift over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Lorenzo and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are severely eroded
- Soils that contain sandy and gravelly deposits at a depth of more than 24 inches
- Soils that have slopes of less than 6 percent or more than 12 percent
- Soils that contain till in the lower part of the profile

Dissimilar soils:
- The excessively drained Rodman soils in the slightly higher positions on the landform
- The poorly drained Dunham soils in depressions and drainageways
- The somewhat poorly drained Grundelein soils in the lower positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Lorenzo soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Markham Series

Drainage class: Moderately well drained
Permeability: Slow
Landform: Moraines and till plains
Parent material: Thin mantle of silty material and the underlying silty clay loam till
Slope range: 2 to 6 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Markham silt loam, 2 to 4 percent slopes, at an elevation of 775 feet, 2,125 feet south and 1,375 feet east of the northwest corner of sec. 16, T. 40 N., R. 9 E., in Du Page County; USGS West Chicago topographic quadrangle; lat. 41 degrees 57 seconds 11 minutes N. and long. 88 degrees 13 minutes 8 seconds W., NAD 27:

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; moderately acid; clear smooth boundary.

A—5 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure parting to weak fine granular; friable; common very fine roots; moderately acid; abrupt smooth boundary.

BA—8 to 12 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; clear wavy boundary.

2Bt1—12 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; friable; common very fine and fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; common fine strong brown (7.5YR 4/6) very weakly cemented iron oxide concretions throughout; 2 percent gravel; slightly acid; clear wavy boundary.

2Bt2—21 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium subangular blocky structure; friable; common very fine and fine roots; few distinct brown (10YR 4/3) clay films on faces of peds and in pores; common fine yellowish red (5YR 4/6) very weakly cemented iron oxide concretions throughout; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; 7 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

2BC—26 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium and coarse angular

blocky structure; firm; common very fine roots; common fine yellowish red (5YR 5/6) very weakly cemented iron oxide concretions throughout; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; 6 percent gravel; strongly effervescent; slightly alkaline; gradual wavy boundary.

2Cd1—32 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; massive; very firm; few very fine roots; common fine yellowish red (5YR 5/6) very weakly cemented iron oxide concretions throughout; 6 percent gravel; violently effervescent; moderately alkaline; gradual wavy boundary.

2Cd2—39 to 60 inches; brown (10YR 5/3) silty clay loam; massive; very firm; common fine yellowish red (5YR 5/6) very weakly cemented iron oxide concretions throughout; 7 percent gravel; violently effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: Less than 18 inches
Depth to carbonates: 18 to 42 inches
Thickness of the solum: 20 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Bt, 2Bt, or 2BC horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 8
Texture—silty clay loam or silty clay

2Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam

531B—Markham silt loam, 2 to 4 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Markham and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a thicker surface layer
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that have a lighter colored surface layer
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Markham soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

531C2—Markham silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Moraines and till plains
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Markham and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have a thicker surface layer
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that have a lighter colored surface layer
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Markham soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

854B—Markham-Ashkum-Beecher complex, 1 to 6 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform:
Markham—summits, shoulders, and backslopes
Ashkum—toeslopes and depressions
Beecher—summits, backslopes, and footslopes

Soil Properties and Qualities

Drainage class:
Markham—moderately well drained
Ashkum—poorly drained
Beecher—somewhat poorly drained
Parent material:
Markham—thin mantle of silty material and the underlying silty clay loam till
Ashkum—silty colluvium and the underlying silty clay loam till
Beecher—thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Markham and similar soils: 35 percent
Ashkum and similar soils: 30 percent
Beecher and similar soils: 30 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have a thicker surface layer
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that have a lighter colored surface layer
- Soils that contain less clay in the subsoil

Dissimilar soils:
- The very poorly drained Houghton, Muskego, and Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Martinton Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Martinton silt loam, 0 to 2 percent slopes, at an elevation of 650 feet, 425 feet north and 160 feet west of the southeast corner of sec. 5, T. 27 N., R. 7 E., in Livingston County; USGS Forrest North topographic quadrangle; lat. 40 degrees 50 minutes 1 second N. and long. 88 degrees 26 minutes 3 seconds W., NAD 27:

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; few

faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

A—7 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

BA—12 to 19 inches; brown (10YR 4/3) silty clay loam; moderate fine angular blocky structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

Btg1—19 to 27 inches; dark grayish brown (10YR 4/2) silty clay; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few very fine roots; common distinct very dark grayish brown (2.5Y 3/2) organo-clay films on faces of peds; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

Btg2—27 to 39 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; firm; few very fine roots; common faint very dark grayish brown (2.5Y 3/2) organo-clay films on faces of peds; few black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; many medium distinct light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

BCtg—39 to 46 inches; grayish brown (2.5Y 5/2) silt loam; weak medium prismatic structure; friable; few faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; very slightly effervescent; slightly alkaline; clear smooth boundary.

Cg—46 to 60 inches; 60 percent grayish brown (2.5Y 5/2) and 40 percent yellowish brown (10YR 5/6), stratified silty clay loam and sandy loam; massive; friable; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; slightly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Depth to carbonates: 24 to 50 inches
Thickness of the solum: 30 to 52 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Btg horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 or 3
Texture—silty clay loam or silty clay

Cg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silt loam, silty clay loam, clay loam, loam, or sandy loam

189A—Martinton silt loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Lacustrine deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Martinton and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have no subsurface layer
- Soils that contain less clay and more silt in the subsoil
- Soils that contain more gravel in the profile

Dissimilar soils:
- The poorly drained Milford soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Martinton soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

849A—Milford-Martinton complex, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform:
Milford—toeslopes and depressions
Martinton—footslopes

Soil Properties and Qualities

Drainage class:
Milford—poorly drained
Martinton—somewhat poorly drained
Parent material: Lacustrine deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Milford and similar soils: 50 percent
Martinton and similar soils: 40 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that contain less clay and more silt in the subsoil
- Soils that have no subsurface layer
- Soils that contain more gravel in the profile

Dissimilar soils:
- The somewhat poorly drained Del Rey soils in the slightly higher positions on the landform
- Clayey Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Milford Series

Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Milford silty clay loam, 0 to 2 percent slopes, at an elevation of 643 feet, 1,450 feet north and 70 feet east of the southwest corner of sec. 4, T. 26 N., R. 14 W., in Iroquois County; USGS Gilman topographic quadrangle; lat. 40 degrees 45 minutes 24 seconds N. and long. 87 degrees 57 minutes 29 seconds W., NAD 27:

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine and fine subangular and angular blocky structure; firm; many fine roots; slightly acid; abrupt smooth boundary.

A—9 to 18 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; moderate and strong very fine subangular blocky structure; firm; common fine roots; slightly acid; clear smooth boundary.

BA—18 to 22 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; moderate fine and medium angular blocky structure; very firm; common fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; common medium prominent olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; common medium distinct dark grayish brown (2.5Y 4/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bg1—22 to 31 inches; gray (5Y 5/1) silty clay loam; moderate medium and coarse prismatic structure parting to moderate medium and coarse angular and subangular blocky; very firm; common fine roots; many distinct dark gray (5Y 4/1) pressure faces; few fine black (N 2.5/0) iron and manganese oxide concretions throughout; many medium prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; many medium distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bg2—31 to 42 inches; gray (5Y 5/1) clay loam; moderate coarse prismatic structure parting to moderate medium and coarse angular blocky; very firm; few fine roots; common medium prominent dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bg3—42 to 50 inches; dark gray (5Y 4/1) silty clay loam stratified with thin bands of clay loam; moderate coarse prismatic structure parting to moderate coarse subangular and angular blocky; firm; few fine roots; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

Cg—50 to 60 inches; gray (5Y 5/1) clay loam stratified with bands of fine sandy loam, silty clay loam, and silty clay; massive; firm; few fine roots; many coarse prominent yellowish brown (10YR 5/4 and 5/8) masses of iron accumulation in the matrix; neutral.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Depth to carbonates: More than 40 inches
Thickness of the solum: 36 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam or silty clay

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam, silty clay, or clay loam

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam, clay loam, silt loam, loam, or sandy loam

69A—Milford silty clay loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Lacustrine deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Milford and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that contain less clay and more silt in the subsoil
- Soils that have no subsurface layer and are lighter colored in the upper part of the subsoil
- Soils that contain more gravel in the profile

Dissimilar soils:
- The somewhat poorly drained Del Rey and Martinton soils in the higher positions on the landform
- Clayey Orthents in positions on the landform similar to those of the Milford soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

849A—Milford-Martinton complex, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform:
Milford—toeslopes and depressions
Martinton—footslopes

Soil Properties and Qualities

Drainage class:
Milford—poorly drained
Martinton—somewhat poorly drained
Parent material: Lacustrine deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Milford and similar soils: 50 percent
Martinton and similar soils: 40 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that contain less clay and more silt in the subsoil
- Soils that have no subsurface layer
- Soils that contain more gravel in the profile

Dissimilar soils:
- The somewhat poorly drained Del Rey soils in the slightly higher positions on the landform
- Clayey Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Millstream Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Silty material and the underlying loamy outwash over sandy and gravelly deposits
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquollic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Millstream silt loam, 0 to 2 percent slopes, at an elevation of 750 feet, 1,000 feet south and 2,000 feet west of the northeast corner of sec. 29, T. 40 N., R. 9 E., in Du Page County; USGS West Chicago topographic quadrangle; lat. 41 degrees 55 minutes 34 seconds N. and long. 88 degrees 13 minutes 50 seconds W., NAD 27:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine roots; moderately acid; clear smooth boundary.

E—8 to 13 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium platy structure; friable; common very fine roots; common fine yellowish brown (10YR 5/6) very weakly cemented iron oxide concretions throughout; moderately acid; clear wavy boundary.

Bt1—13 to 17 inches; olive brown (2.5Y 4/3) silty clay loam; moderate medium subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and in pores; common fine and medium yellowish brown (10YR 5/6) very weakly cemented iron oxide concretions throughout; common medium distinct dark grayish brown (10YR 4/2) iron depletions in the matrix; moderately acid; clear wavy boundary.

Bt2—17 to 24 inches; olive brown (2.5Y 4/3) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular and angular blocky; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films and dark grayish brown (2.5Y 4/2) clay films on faces of peds and in pores; common fine and medium yellowish brown (10YR 5/6) very weakly cemented iron oxide concretions throughout; many medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; neutral; clear wavy boundary.

Bt3—24 to 30 inches; light olive brown (2.5Y 5/3) silty clay loam; moderate medium angular blocky structure; friable; common very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds and in pores; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many medium and coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; common very dark gray (N 3/0) krotovinas; neutral; gradual wavy boundary.

2Bt4—30 to 34 inches; light olive brown (2.5Y 5/3) silty clay loam; weak medium angular blocky structure; friable; few very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds and in pores; common medium and coarse black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many medium and coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; common medium white (2.5Y 8/1) soft masses of carbonate throughout; 5 percent gravel; common very dark gray (N 3/0) krotovinas; slightly effervescent; slightly alkaline; gradual wavy boundary.

2Bt5—34 to 37 inches; grayish brown (2.5Y 5/2) clay

loam; weak medium angular blocky structure; friable; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium and coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; common medium white (2.5Y 8/1) soft masses of carbonate throughout; 14 percent gravel; common very dark gray (N 3/0) krotovinas; strongly effervescent; moderately alkaline; gradual wavy boundary.

2BC—37 to 46 inches; light olive brown (2.5Y 5/4) gravelly loam; weak medium subangular blocky structure; friable; common medium and coarse prominent olive yellow (2.5Y 6/8) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium distinct light brownish gray (2.5Y 6/2) and brown (10YR 5/3) iron depletions in the matrix; common medium white (2.5Y 8/1) soft masses of carbonate throughout; 20 percent gravel; common very dark gray (N 3/0) krotovinas; strongly effervescent; moderately alkaline; gradual wavy boundary.

3C—46 to 65 inches; light olive brown (2.5Y 5/4) gravelly loamy sand; single grain; loose; common medium and coarse prominent yellowish brown (10YR 5/6) and olive yellow (2.5Y 6/8) masses of iron accumulation in the matrix; many medium distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; many medium white (2.5Y 8/1) soft masses of carbonate throughout; 25 percent gravel; common very dark gray (N 3/0) krotovinas; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: 24 to 45 inches
Depth to sandy and gravelly deposits: 32 to 50 inches
Depth to carbonates: 30 to 50 inches
Thickness of the solum: 36 to 50 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—clay loam, silt loam, loam, sandy clay loam, sandy loam, loamy sand, or the gravelly analogs of these textures
Content of gravel—0 to 20 percent

3C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—gravelly loamy sand to extremely gravelly coarse sand
Content of gravel—15 to 70 percent

557A—Millstream silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Silty material and the underlying loamy outwash over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Millstream and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a darker subsurface layer
- Soils that have a lighter colored surface layer
- Soils that contain more sand in the upper one-half of the profile
- Soils that contain less sand and more clay in the lower part of the profile
- Soils that contain sandy and gravelly deposits at a depth of less than 32 inches or more than 50 inches

Dissimilar soils:
- The poorly drained Dunham soils and the very poorly drained Houghton and Muskego soils in depressions and drainageways
- The well drained Bowes and Waupecan soils in the higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Millstream soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Mundelein Series

Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Silty material and the underlying loamy outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Mundelein silt loam, 0 to 2 percent slopes, at an elevation of 792 feet, 780 feet north and 1,560 feet east of the southwest corner of sec. 14, T. 45 N., R. 10 E., in Lake County; USGS Grayslake topographic quadrangle; lat. 42 degrees 22 minutes 24 seconds N. and long. 88 degrees 2 minutes 17 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to weak fine granular; friable; common very fine roots; slightly acid; clear smooth boundary.

A—7 to 13 inches; black (N 2.5/0) silt loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to weak fine granular; friable; common very fine roots; neutral; clear smooth boundary.

AB—13 to 17 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine and fine subangular blocky structure parting to weak fine granular; friable; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—17 to 21 inches; brown (10YR 4/3) silty clay loam; moderate very fine and fine subangular blocky structure; friable; few distinct black (10YR 2/1) organic coatings on faces of peds; few distinct very dark grayish brown (10YR 3/2) organo-clay films and dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt2—21 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) and brown (10YR 4/3) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; neutral; clear smooth boundary.

Bt3—26 to 31 inches; light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine prominent light brownish gray (10YR 6/2) iron depletions in the matrix; 4 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—31 to 42 inches; 65 percent yellowish brown (10YR 5/4 and 5/6) and 35 percent light brownish gray (2.5Y 6/2), stratified silt loam and loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 8 percent gravel; strongly effervescent; moderately alkaline; gradual smooth boundary.

2C—42 to 60 inches; 35 percent light brown (7.5YR 6/3), 35 percent yellowish brown (10YR 5/6), and 30 percent light brownish gray (2.5Y 6/2), stratified loam and silt loam; massive; friable; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 6 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the silty material: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 50 inches

Ap, A, or AB horizon:
Hue—10YR or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silt loam, loam, clay loam, sandy clay loam, or sandy loam

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 8
Texture—stratified silt loam to very fine sand

442A—Mundelein silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Mundelein and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that contain loamy outwash at a depth of less than 20 inches or more than 40 inches
- Soils that contain till in the lower part of the profile
- Soils that have no subsurface layer
- Soils that contain sandy and gravelly deposits in the lower part of the profile
- Soils that have carbonates at a depth of more than 40 inches
- Soils that have a seasonal high water table at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Drummer and Thorp soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Mundelein soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

848B—Drummer-Barrington-Mundelein complex, 1 to 6 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform:
Drummer—toeslopes and depressions
Barrington—summits, shoulders, and backslopes
Mundelein—footslopes

Soil Properties and Qualities

Drainage class:
Drummer—poorly drained
Barrington—moderately well drained
Mundelein—somewhat poorly drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Drummer and similar soils: 35 percent
Barrington and similar soils: 30 percent
Mundelein and similar soils: 30 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that contain sandy and gravelly deposits in the lower part of the profile

- Soils that contain till in the lower part of the profile
- Soils that have a thinner surface layer

Dissimilar soils:
- Loamy Orthents in positions on the landform similar to those of the major soils
- The very poorly drained Houghton, Muskego, and Peotone soils in depressions and drainageways

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Muskego Series

Drainage class: Very poorly drained
Permeability: Moderate in the upper part; slow in the lower part
Landform: Till plains, outwash plains, and lake plains
Parent material: Herbaceous organic material over coprogenous deposits
Slope range: 0 to 2 percent

Taxonomic classification: Coprogenous, euic, mesic Limnic Haplosaprists

Typical Pedon for MLRA 110

Typical pedon of Muskego muck, in an area of Muskego and Houghton mucks, 0 to 2 percent slopes, at an elevation of 745 feet, 255 feet west and 1,950 feet north of the southeast corner of sec. 15, T. 39 N., R. 10 E., in Du Page County; USGS Wheaton topographic quadrangle; lat. 41 degrees 51 minutes 49 seconds N. and long. 88 degrees 4 minutes 23 seconds W., NAD 27:

Oa1—0 to 5 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed, dark gray (N 4/0) dry; less than 5 percent fiber rubbed; weak fine granular structure; friable; many very fine roots; slightly acid; clear smooth boundary.
Oa2—5 to 11 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; less than 5 percent fiber rubbed; moderate fine subangular blocky structure; friable; common very fine and fine roots; neutral; clear smooth boundary.
Oa3—11 to 22 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; less than 5 percent fiber rubbed; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; slightly acid; clear wavy boundary.
Oa4—22 to 36 inches; muck (sapric material), 60 percent black (N 2.5/0) and 40 percent dark brown (7.5YR 3/3) broken face and rubbed; 10 percent fiber rubbed; weak thick platy structure; friable; common very fine roots; slightly acid; clear wavy boundary.
Lco1—36 to 47 inches; 90 percent very dark gray (5Y 3/1) and 10 percent dark brown (7.5YR 3/4) coprogenous earth; 5 percent fiber rubbed; very friable; massive; common very fine roots; neutral; gradual wavy boundary.
Lco2—47 to 60 inches; very dark gray (5Y 3/1) coprogenous earth; 5 percent fiber rubbed; very friable; massive; common very fine roots; 4 percent snail shells; neutral.

MLRA Series Range in Characteristics

Depth to coprogenous deposits: 16 to 51 inches

Surface tier:
Hue—10YR, 2.5Y, or neutral
Value—2 or 3
Chroma—0 or 1

Subsurface tier:
Hue—7.5YR, 10YR, or neutral
Value—2 or 3
Chroma—0 to 3

Lco horizon:
Hue—10YR, 2.5Y, or 5Y
Value—2 to 4
Chroma—1 to 3

903A—Muskego and Houghton mucks, 0 to 2 percent slopes

Setting

Landform: Till plains, outwash plains, and lake plains
Position on the landform: Depressions

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material:
Muskego—herbaceous organic material over coprogenous deposits
Houghton—herbaceous organic material

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Muskego and similar soils: 50 percent
Houghton and similar soils: 40 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have organic deposits less than 51 inches thick
- Soils that have carbonates at or near the surface
- Soils that have less organic matter in the surface layer
- Soils that are lighter colored in the lower one-half of the profile

Dissimilar soils:
- The poorly drained Drummer, Dunham, and Milford soils in the slightly higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

1903A—Muskego and Houghton mucks, undrained, 0 to 2 percent slopes

Setting

Landform: Till plains, outwash plains, and lake plains
Position on the landform: Depressions

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material:
Muskego—herbaceous organic material over coprogenous deposits
Houghton—herbaceous organic material

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Muskego and similar soils: 50 percent
Houghton and similar soils: 40 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have organic deposits less than 51 inches thick
- Soils that have less organic matter in the surface layer
- Soils that have carbonates at or near the surface
- Soils that are lighter colored in the lower one-half of the profile

Dissimilar soils:
- The poorly drained Drummer, Dunham, and Milford soils in the slightly higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

4904A—Muskego and Peotone soils, ponded, 0 to 2 percent slopes

Setting

Landform: Outwash plains and till plains
Position on the landform: Depressions

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material:
Muskego—herbaceous organic material over coprogenous deposits
Peotone—silty colluvium and the underlying drift

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Muskego and similar soils: 50 percent
Peotone and similar soils: 40 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have carbonates at or near the surface
- Soils that have less organic matter in the surface layer
- Soils that are lighter colored in the upper part of the subsoil
- Soils that contain less clay in the subsurface layer and subsoil

• Soils that are overlain by recent, light-colored deposition

Dissimilar soils:
• The somewhat poorly drained Mundelein and Elliott soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Forestland" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

535B—Orthents, stony, undulating

Setting

Landform: Flood plains
Slope: 1 to 6 percent

Soil Properties and Qualities

Drainage class: Well drained

Description

This unit consists of disturbed, calcareous soil material, stones, and boulders from spoil banks that were formed during dredging operations. The surface layer is very dark grayish brown, friable stony loam about 6 inches thick. The underlying material to a depth of 60 inches or more is brown, dark yellowish brown, and yellowish brown, friable and firm stony clay loam and stony loam.

Composition

Orthents and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
• Soils that contain less than 15 percent stones in the profile
• Soils that have carbonates at a depth of more than 10 inches
• Soils that have a seasonal high water table at a depth of less than 4 feet

Dissimilar soils:
• The poorly drained Faxon and Sawmill soils and the very poorly drained Houghton and Muskego soils in depressions and drainageways

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

802B—Orthents, loamy, undulating

Setting

Landform: Moraines, outwash plains, and stream terraces
Slope: 1 to 6 percent

Soil Properties and Qualities

Drainage class: Well drained

Description

This unit consists of disturbed soil material. The surface layer is very dark grayish brown, friable loam about 6 inches thick. The underlying material extends to a depth of 60 inches or more. It is brown and dark yellowish brown, firm clay loam and silty clay loam in the upper part and mottled yellowish brown and brown, firm loam in the lower part.

Composition

Orthents and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
• Soils that contain more silt and less sand in the profile
• Soils that contain more than 15 percent gravel in the lower one-half of the profile
• Soils that have a seasonal high water table at a depth of less than 4 feet

Dissimilar soils:
• The poorly drained Drummer soils and the very poorly drained Houghton and Muskego soils in depressions and drainageways
• Soils that have carbonates at or near the surface

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

802D—Orthents, loamy, rolling

Setting

Landform: Moraines, outwash plains, and stream terraces
Slope: 6 to 12 percent

Soil Properties and Qualities

Drainage class: Well drained

Description

This unit consists of disturbed soil material. The surface layer is very dark grayish brown, friable loam about 6 inches thick. The underlying material extends to a depth of 60 inches or more. It is brown and dark yellowish brown, firm clay loam and silty clay loam in the upper part and mottled yellowish brown and brown, firm loam in the lower part.

Composition

Orthents and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that contain more silt and less sand in the profile
- Soils that contain more than 15 percent gravel in the lower one-half of the profile
- Soils that have a seasonal high water table at a depth of less than 4 feet
- Soils that have slopes of less than 6 percent

Dissimilar soils:
- The poorly drained Drummer soils and the very poorly drained Houghton and Muskego soils in depressions and drainageways
- Soils that have carbonates at or near the surface

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

805B—Orthents, clayey, undulating

Setting

Landform: Lake plains and moraines
Slope: 1 to 6 percent

Soil Properties and Qualities

Drainage class: Moderately well drained

Description

This unit consists of disturbed soil material. The surface layer is very dark gray, firm silty clay 6 inches thick. The underlying material extends to a depth of 60 inches or more. It is brown and yellowish brown, firm silty clay in the upper part and mottled olive brown, light olive brown, and grayish brown, firm silty clay and silty clay loam in the lower part.

Composition

Orthents and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that contain more silt and less clay in the profile
- Soils that contain more sand and less clay in the profile
- Soils that have a seasonal high water table at a depth of more than 4 feet

Dissimilar soils:
- The poorly drained Ashkum soils and very poorly drained Houghton, Muskego, and Peotone soils in depressions and drainageways
- Soils that have carbonates at or near the surface

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Ozaukee Series

Drainage class: Moderately well drained
Permeability: Slow
Landform: Moraines and till plains
Parent material: Thin mantle of silty material and the underlying silty clay loam till
Slope range: 2 to 30 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Ozaukee silt loam, 2 to 4 percent slopes, at an elevation of 780 feet, 2,540 feet north and 2,200 feet east of the southwest corner of sec. 31, T. 39 N., R. 10 E., in Du Page County; USGS Naperville topographic quadrangle; lat. 41 degrees 49 minutes 13 seconds N. and long. 88 degrees 8 minutes 29 seconds W., NAD 27:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, yellowish brown (10YR 5/4) dry; moderate

very fine and fine granular structure; friable; many very fine and fine roots; neutral; clear smooth boundary.

BE—4 to 10 inches; brown (10YR 4/3) silt loam; weak medium platy structure parting to moderate fine subangular blocky; friable; many very fine roots; few distinct dark grayish brown (10YR 4/2) coatings on faces of peds; moderately acid; clear smooth boundary.

2Bt1—10 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; many distinct brown (10YR 4/3) clay films on faces of peds; 1 percent gravel; slightly acid; abrupt smooth boundary.

2Bt2—16 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organo-clay films and brown (10YR 4/3) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent gravel; neutral; clear smooth boundary.

2Bt3—21 to 27 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 8 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Bt4—27 to 33 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concentrations throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 8 percent gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

2BCt—33 to 39 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine and medium subangular blocky structure; firm; common very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concentrations throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 6 percent gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2Cd—39 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; very firm; few very fine roots; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; many medium white (10YR 8/1) carbonate concretions throughout; 6 percent gravel; violently effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: Less than 18 inches
Depth to carbonates: 15 to 40 inches
Thickness of the solum: 20 to 40 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam or silty clay loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam or silty clay

2Cd horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 4
Texture—silty clay loam or clay loam

530B—Ozaukee silt loam, 2 to 4 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Ozaukee and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are moderately eroded
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that contain more sand and less silt in the lower part of the profile
- Soils that have a thicker, darker surface layer
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

530C2—Ozaukee silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Moraines and till plains
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Ozaukee and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a thicker, darker surface layer
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that are severely eroded
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that contain more sand and less silt in the lower part of the profile

Dissimilar soils:
- The poorly drained Ashkum soils in depressions and drainageways
- Calcareous soils in positions on the landform similar to those of the Ozaukee soil
- Clayey Orthents in positions on the landform similar to those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

530D2—Ozaukee silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Moraines
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Ozaukee and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that are severely eroded
- Soils that have slopes of less than 6 percent or more than 12 percent
- Soils that contain more sand and less silt in the lower part of the profile

Dissimilar soils:
- The poorly drained Ashkum soils in depressions and drainageways
- Calcareous soils in positions on the landform similar to those of the Ozaukee soil
- Clayey Orthents in positions on the landform similar to those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

530D3—Ozaukee silty clay loam, 6 to 12 percent slopes, severely eroded

Setting

Landform: Moraines
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Ozaukee and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are moderately eroded
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that have slopes of less than 6 percent or more than 12 percent
- Soils that contain more sand and less silt in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum soils in depressions and drainageways
- Calcareous soils in positions on the landform similar to those of the Ozaukee soil
- Clayey Orthents in positions on the landform similar to those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

530E—Ozaukee silt loam, 12 to 20 percent slopes

Setting

Landform: Moraines
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Ozaukee and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are moderately eroded
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that have slopes of less than 12 percent or more than 20 percent
- Soils that contain more sand and less silt in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum soils in depressions and drainageways
- Calcareous soils in positions on the landform similar to those of the Ozaukee soil
- Clayey Orthents in positions on the landform similar to those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

530F—Ozaukee silt loam, 20 to 30 percent slopes

Setting

Landform: Moraines
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Ozaukee and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are moderately eroded
- Soils that contain more sand and less clay in the upper one-half of the profile
- Soils that have slopes of less than 20 percent or more than 30 percent
- Soils that contain more sand and less silt in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum soils in depressions and drainageways
- Calcareous soils in positions on the landform similar to those of the Ozaukee soil
- Clayey Orthents in positions on the landform similar to those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Peotone Series

Drainage class: Very poorly drained
Permeability: Moderately slow

Landform: Moraines, till plains, and outwash plains
Parent material: Silty colluvium and the underlying drift
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Peotone silty clay loam, 0 to 2 percent slopes, at an elevation of 707 feet, 315 feet south and 2,233 feet east of the northwest corner of sec. 21, T. 29 N., R. 9 E., in Ford County; USGS Cabery topographic quadrangle; lat. 40 degrees 48 minutes 58 seconds N. and long. 88 degrees 12 minutes 2 seconds W., NAD 27:

Ap—0 to 7 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
A—7 to 13 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
Bg1—13 to 27 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; moderate medium angular blocky structure; friable; common very fine roots; neutral; clear smooth boundary.
Bg2—27 to 41 inches; dark gray (10YR 4/1) silty clay; moderate fine prismatic structure; firm; common very fine roots; common fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.
Bg3—41 to 50 inches; dark gray (10YR 4/1) silty clay; moderate medium prismatic structure; firm; few very fine roots; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.
Cg—50 to 60 inches; dark gray (10YR 4/1) silty clay loam; massive; firm; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to carbonates: More than 24 inches
Thickness of the solum: 38 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam or silt loam

330A—Peotone silty clay loam, 0 to 2 percent slopes

Setting

Landform: Moraines, till plains, and outwash plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material: Silty colluvium and the underlying drift

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Peotone and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
• Soils that contain less clay in the subsurface layer and subsoil
• Soils that are overlain by recent, light-colored deposition
• Soils that are lighter colored in the upper part of the subsoil

Dissimilar soils:
• The mucky Houghton and Muskego soils in positions on the landform similar to those of the Peotone soil
• The somewhat poorly drained Mundelein and Elliott soils in the higher positions on the landform
• Clayey Orthents in positions on the landform similar to those of the Peotone soil

Management

For general and detailed information about

managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

1330A—Peotone silty clay loam, undrained, 0 to 2 percent slopes

Setting

Landform: Moraines, till plains, and outwash plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material: Silty colluvium and the underlying drift

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Peotone and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that are lighter colored in the upper part of the subsoil
- Soils that contain less clay in the subsurface layer and subsoil
- Soils that are overlain by recent, light-colored deposition

Dissimilar soils:
- The somewhat poorly drained Mundelein and Elliott soils in the higher positions on the landform
- The mucky Houghton and Muskego soils in positions on the landform similar to those of the Peotone soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

4904A—Muskego and Peotone soils, ponded, 0 to 2 percent slopes

Setting

Landform: Outwash plains and till plains
Position on the landform: Depressions

Soil Properties and Qualities

Drainage class: Very poorly drained
Parent material:
Muskego—herbaceous organic material over coprogenous deposits
Peotone—silty colluvium and the underlying drift

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Muskego and similar soils: 50 percent
Peotone and similar soils: 40 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have carbonates at or near the surface
- Soils that have less organic matter in the surface layer
- Soils that are lighter colored in the upper part of the subsoil
- Soils that contain less clay in the subsurface layer and subsoil
- Soils that are overlain by recent, light-colored deposition

Dissimilar soils:
- The somewhat poorly drained Mundelein and Elliott soils in the higher positions on the landform

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

864—Pits, quarry

Description

This unit consists of nearly level and gently sloping areas from which limestone has been extracted. The

pits have nearly vertical sidewalls. Some pits are active, but others have been abandoned. Some contain water.

Management

Some of the abandoned, larger pits are used as recreational areas.

865—Pits, gravel

Description

This unit consists of nearly level and gently sloping areas from which gravel has been extracted. The pits have nearly vertical sidewalls. Some pits are active, but others have been abandoned. Some contain water.

Management

Some of the abandoned, larger pits are used as recreational areas.

Rockton Series

Drainage class: Well drained
Permeability: Moderate
Landform: Knolls
Parent material: Glacial drift over bedrock
Slope range: 2 to 6 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Rockton silt loam, 0 to 2 percent slopes, at an elevation of 676 feet, 550 feet north and 2,600 feet east of the southwest corner of sec. 19, T. 27 N., R. 6 E., in Livingston County; USGS Southeast Pontiac topographic quadrangle; lat. 40 degrees 47 minutes 19 seconds N. and long. 88 degrees 34 minutes 28 seconds W., NAD 27:

Ap—0 to 11 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.
BA—11 to 16 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; friable; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.
Bt1—16 to 22 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.
Bt2—22 to 28 inches; brown (7.5YR 4/4) clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; common distinct dark brown (7.5YR 3/2) clay films on faces of peds; 2 percent gravel; slightly acid; clear smooth boundary.
Bt3—28 to 35 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; friable; few very fine roots; many distinct dark brown (7.5YR 3/2) clay films on faces of peds; 5 percent gravel; slightly acid; abrupt smooth boundary.
2R—35 inches; limestone bedrock.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Depth to bedrock: 20 to 40 inches
Thickness of the solum: 20 to 40 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—clay loam, loam, or sandy clay loam

503B—Rockton silt loam, 2 to 6 percent slopes

Setting

Landform: Knolls
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Glacial drift over bedrock

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Rockton and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that are moderately eroded
- Soils that contain less sand in the upper one-half of the subsoil
- Soils that have slopes of less than 2 percent or more than 6 percent
- Soils that have bedrock at a depth of less than 20 inches or more than 40 inches
- Soils that have a thinner surface layer

Dissimilar soils:
- The poorly drained Faxon soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Rockton soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Rodman Series

Drainage class: Excessively drained
Permeability: Very rapid
Landform: Stream terraces, kames, outwash plains, and moraines
Parent material: Gravelly drift
Slope range: 20 to 30 percent

Taxonomic classification: Sandy-skeletal, mixed, mesic Typic Hapludolls

Typical Pedon for MLRA 110

Typical pedon of Rodman gravelly loam, 6 to 12 percent slopes, at an elevation of 530 feet, 2,120 feet south and 740 feet west of the northeast corner of sec. 9, T. 33 N., R. 9 E., in Will County; USGS Wilmington topographic quadrangle; lat. 41 degrees 21 minutes 25 seconds N. and long. 88 degrees 11 minutes 43 seconds W., NAD 27:

A—0 to 8 inches; very dark grayish brown (10YR 3/2) gravelly loam, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; many very fine and common fine roots; 15 percent gravel; neutral; clear smooth boundary.

Bw—8 to 12 inches; dark brown (10YR 3/3) gravelly loam; weak fine subangular blocky structure parting to weak fine granular; very friable; common very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 15 percent gravel; slightly alkaline; abrupt smooth boundary.

C1—12 to 18 inches; brown (10YR 4/3) very gravelly loamy sand; single grain; loose; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on sand and gravel; 40 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

C2—18 to 60 inches; dark yellowish brown (10YR 4/4) very gravelly sand; single grain; loose; few very fine roots; 45 percent gravel and 15 percent cobbles; slightly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 6 to 15 inches
Depth to carbonates: 10 to 15 inches
Thickness of the solum: 10 to 15 inches

A horizon:
- Hue—7.5YR or 10YR
- Value—2 or 3
- Chroma—1 or 2
- Texture—loam, sandy loam, or the gravelly analogs of these textures
- Content of gravel—10 to 25 percent

Bw horizon:
- Hue—7.5YR or 10YR
- Value—3 or 4
- Chroma—2 or 3
- Texture—loam, sandy loam, or the gravelly analogs of these textures
- Content of gravel—10 to 35 percent

C horizon:
- Hue—10YR
- Value—3 to 5
- Chroma—1 to 4
- Texture—the very gravelly or extremely gravelly analogs of loamy sand, sand, loamy coarse sand, or coarse sand
- Content of gravel—35 to 70 percent

969F—Casco-Rodman complex, 20 to 30 percent slopes

Setting

Landform: Stream terraces, kames, outwash plains, and moraines
Position on the landform: Backslopes

Soil Properties and Qualities

Drainage class:
- Casco—somewhat excessively drained
- Rodman—excessively drained

Parent material:
Casco—loamy drift over sandy and gravelly deposits
Rodman—gravelly drift

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Casco and similar soils: 45 percent
Rodman and similar soils: 40 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have carbonates at or near the surface
- Soils that contain sandy and gravelly deposits at a depth of more than 20 inches
- Soils that have slopes of less than 20 percent or more than 30 percent
- Soils that are moderately eroded
- Soils that contain till in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
- The poorly drained Dunham soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the major soils

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Romeo Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Parent material: Thin mantle of loamy deposits over limestone bedrock
Slope range: 0 to 2 percent

Taxonomic classification: Loamy, mixed, superactive, mesic Lithic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Romeo silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 585 feet, 150 feet south and 1,280 feet east of the northwest corner of sec. 25, T. 37 N., R. 10 E., in Will County; USGS Romeoville topographic quadrangle; lat. 41 degrees 40 minutes 13 seconds N. and long. 88 degrees 2 minutes 27 seconds W., NAD 27:

A—0 to 8 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; many very fine to coarse roots; 3 percent gravel; neutral; abrupt smooth boundary.
2R—8 inches; unweathered limestone bedrock.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 2 to 10 inches
Depth to bedrock: Less than 10 inches
Thickness of the solum: 2 to 10 inches

A horizon:
Hue—10YR or 2.5Y
Value—2 or 3
Chroma—1 or 2
Texture—silt loam, silty clay loam, loam, or clay loam

3316A—Romeo silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Thin mantle of loamy deposits over limestone bedrock

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Romeo and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have bedrock at a depth of more than 10 inches
- Soils that contain more than 15 percent coarse fragments in the surface layer

Dissimilar soils:
- The moderately deep Faxon and very deep Sawmill

soils in positions on the landform similar to those of the Romeo soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Rush Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains, stream terraces, and kames
Parent material: Silty material and the underlying loamy and gravelly outwash
Slope range: 2 to 4 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Rush silt loam, 0 to 2 percent slopes, at an elevation of 712 feet, 175 feet south and 470 feet west of the northeast corner of sec. 15, T. 39 N., R. 8 E., in Kane County; USGS Aurora North topographic quadrangle; lat. 41 degrees 52 minutes 9 seconds N. and long. 88 degrees 18 minutes 8 seconds W., NAD 27:

A—0 to 4 inches; very dark gray (10YR 3/1) silt loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.
E—4 to 11 inches; 60 percent dark grayish brown (10YR 4/2) and 40 percent brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; weak thick platy structure; friable; common very fine roots; strongly acid; abrupt smooth boundary.
Bt1—11 to 18 inches; 55 percent brown (10YR 4/3) and 45 percent dark yellowish brown (10YR 4/4) silty clay loam; weak very fine subangular blocky structure; friable; common very fine roots; strongly acid; clear smooth boundary.
Bt2—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.
Bt3—24 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.
Bt4—32 to 38 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak coarse subangular blocky structure; firm; few very fine roots; few distinct brown (10YR 4/3) and dark brown (10YR 3/3) clay films on faces of peds; slightly acid; abrupt smooth boundary.
2Bt5—38 to 45 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse subangular blocky structure; firm; few very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; 12 percent gravel; slightly acid; abrupt smooth boundary.
3C—45 to 60 inches; yellowish brown (10YR 5/4) gravelly sand; single grain; loose; 25 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: 24 to 40 inches
Depth to sandy and gravelly deposits: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Thickness of the solum: 40 to 70 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—clay loam, loam, sandy clay loam, sandy loam, or the gravelly analogs of these textures
Content of gravel—0 to 35 percent

3C horizon:
Hue—10YR
Value—5 or 6

Chroma—2 to 4
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, coarse sand, or loamy coarse sand
Content of gravel—20 to 70 percent

791B—Rush silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains, stream terraces, and kames
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Silty material and the underlying loamy and gravelly outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Rush and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that have a darker subsurface layer
- Soils that contain sandy and gravelly deposits at a depth of less than 40 inches or more than 60 inches
- Soils that contain more sand in the upper and middle parts of the subsoil
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The poorly drained Dunham soils in depressions and drainageways
- The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
- The loamy Fox soils in the higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Rush soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Sawmill Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded, at an elevation of 636 feet, 1,350 feet south and 140 feet west of the northeast corner of sec. 31, T. 30 N., R. 3 E., in Livingston County; USGS Long Point topographic quadrangle; lat. 41 degrees 30 minutes 37 seconds N. and long. 88 degrees 54 minutes 42 seconds W., NAD 27:

Ap—0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.
A1—9 to 17 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.
A2—17 to 24 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate medium granular; friable; few very fine roots; 1 percent gravel; neutral; clear smooth boundary.
A3—24 to 29 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; 1 percent gravel; neutral; clear smooth boundary.
Bg1—29 to 36 inches; dark gray (5Y 4/1) silty clay loam; weak medium prismatic structure; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine prominent dark grayish brown (10YR 4/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.
Bg2—36 to 41 inches; dark gray (5Y 4/1) silty clay loam; weak medium prismatic structure; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of

peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine prominent dark grayish brown (10YR 4/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.

BCg—41 to 48 inches; dark gray (5Y 4/1) silty clay loam; very weak medium prismatic structure; firm; few very fine roots; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine prominent dark grayish brown (10YR 4/2) iron depletions in the matrix; 1 percent gravel; neutral; abrupt smooth boundary.

Cg—48 to 60 inches; 60 percent gray (10YR 5/1) and 40 percent brownish yellow (10YR 6/6) silt loam; massive; firm; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 1 percent gravel; slightly alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to carbonates: More than 48 inches
Thickness of the solum: 36 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam

Bg or BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, or loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or clay loam with strata of loam, silt loam, or sandy loam

1107A—Sawmill silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Alluvium

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Sawmill and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that contain less clay in the profile
- Soils that are overlain by recent, light-colored deposition
- Soils that have a thinner subsurface layer
- Soils that contain sandy and gravelly deposits in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on the higher adjacent landforms
- The very poorly drained Muskego and Houghton soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

3107A—Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Alluvium

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Sawmill and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are overlain by recent, light-colored deposition
- Soils that have a thinner subsurface layer
- Soils that contain sandy and gravelly deposits in the lower part of the profile
- Soils that contain less clay in the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein and Mundelein soils on the higher adjacent landforms
- The very poorly drained Muskego and Houghton soils in depressions

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Selma Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Loamy outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon for MLRA 110

Typical pedon of Selma loam, 0 to 2 percent slopes, at an elevation of 607 feet, 2,784 feet north and 72 feet east of the southwest corner of sec. 20, T. 32 N., R. 7 E., in Grundy County; USGS Mazon topographic quadrangle; lat. 41 degrees 14 minutes 0 seconds N. and long. 88 degrees 27 minutes 24 seconds W., NAD 27:

Ap—0 to 8 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak medium granular structure; friable; neutral; abrupt smooth boundary.

A—8 to 16 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; weak fine granular structure; friable; neutral; clear smooth boundary.

Bg1—16 to 20 inches; dark gray (5Y 4/1) loam; moderate fine subangular blocky structure; firm; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; slightly alkaline; clear smooth boundary.

Bg2—20 to 30 inches; gray (5Y 6/1) loam; moderate fine subangular blocky structure; firm; common prominent very dark gray (10YR 3/1) organic coatings in root channels and on faces of peds; few fine brown (10YR 4/3) iron oxide concretions throughout; few fine prominent brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Bg3—30 to 38 inches; gray (5Y 6/1) clay loam; weak medium prismatic structure; firm; few fine brown (10YR 4/3) iron oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; gradual smooth boundary.

BCg—38 to 45 inches; gray (10YR 6/1) loam; weak medium prismatic structure; firm; few fine brown (10YR 4/3) iron oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; moderately alkaline; clear smooth boundary.

Cg—45 to 54 inches; gray (10YR 6/1) loamy sand; single grain; loose; few fine prominent brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; slightly effervescent; moderately alkaline; gradual smooth boundary.

C—54 to 60 inches; yellowish brown (10YR 5/6) sand with thin strata of loam and silt loam; single grain; loose; common fine prominent light gray (10YR 6/1) iron depletions in the matrix; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: More than 30 inches
Thickness of the solum: 35 to 55 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam, clay loam, or silt loam

Bg or BCg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—loam, clay loam, silt loam, silty clay loam, or sandy loam

Cg or C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6

Chroma—1 to 6
Texture—sandy loam, loam, silt loam, loamy sand, or sand

125A—Selma loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Selma and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that contain less sand and more silt in the upper two-thirds of the profile
- Soils that have no subsurface layer
- Soils that contain less clay in the subsoil

Dissimilar soils:
- The very poorly drained Houghton and Muskego soils in depressions
- Loamy Orthents in positions on the landform similar to those of the Selma soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Swygert Series

Drainage class: Somewhat poorly drained
Permeability: Very slow
Landform: Moraines and till plains
Parent material: Thin mantle of silty material and the underlying lacustrine deposits and clayey till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Aquertic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Swygert silty clay loam, 0 to 2 percent slopes, at an elevation of 675 feet, 339 feet south and 66 feet east of the northwest corner of sec. 7, T. 25 N., R. 13 W., in Iroquois County; USGS Onarga East topographic quadrangle; lat. 40 degrees 38 minutes 36 seconds N. and long. 87 degrees 53 minutes 2 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine granular structure; friable; many fine roots; slightly acid; abrupt wavy boundary.
A—7 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium angular blocky structure parting to weak fine subangular blocky; friable; many fine roots; common black (N 2.5/0) krotovinas; slightly acid; abrupt smooth boundary.
Bt1—12 to 18 inches; very dark grayish brown (10YR 3/2) silty clay, gray (10YR 5/1) dry; moderate fine subangular blocky structure; friable; many fine roots; many distinct black (10YR 2/1) and very dark gray (10YR 3/1) organo-clay films on faces of peds; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; common fine distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.
Bt2—18 to 26 inches; brown (10YR 4/3) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; friable; common fine roots; many distinct very dark grayish brown (10YR 3/2) organo-clay films and dark grayish brown (10YR 4/2) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine prominent olive gray (5Y 5/2) iron depletions in the matrix; neutral; clear smooth boundary.
Bt3—26 to 31 inches; yellowish brown (10YR 5/4) silty clay; moderate medium prismatic structure parting to weak medium and fine angular blocky; firm; common fine roots; common distinct very dark gray (10YR 3/1) organo-clay films in root channels; common distinct dark gray (10YR 4/1) and gray (10YR 5/1) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine prominent gray (5Y 5/1) iron depletions in the matrix; common very dark gray

(10YR 3/1) krotovinas; slightly effervescent (7 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.

2Bt4—31 to 41 inches; light olive brown (2.5Y 5/4) silty clay; moderate medium prismatic structure parting to weak coarse angular blocky; very firm; few fine roots; common prominent very dark gray (10YR 3/1) organo-clay films and gray (5Y 5/1) clay films on faces of peds; common medium prominent gray (5Y 5/1) iron depletions in the matrix; slightly effervescent (16 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.

2BCt—41 to 51 inches; light olive brown (2.5Y 5/4) silty clay; weak coarse prismatic structure; very firm; few fine roots; common distinct very dark gray (5Y 3/1) organo-clay films in root channels; many distinct dark gray (5Y 4/1) clay films on faces of peds; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; few fine prominent olive (5Y 5/6) and strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine prominent gray (5Y 5/1) iron depletions in the matrix; strongly effervescent (18 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.

2Cd—51 to 60 inches; brown (10YR 5/3) silty clay; massive; very firm; many gray (5Y 6/1) pressure faces; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; few coarse prominent strong brown (7.5YR 5/6 and 5/8) masses of iron accumulation in the matrix; strongly effervescent (19 percent calcium carbonate equivalent); moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the silty material: Less than 20 inches
Depth to carbonates: 20 to 45 inches
Thickness of the solum: 35 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam or silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—1 to 4
Texture—silty clay loam or silty clay

2Bt horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 to 6
Texture—silty clay or clay

2BCt or 2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay, clay, or silty clay loam

91A—Swygert silty clay loam, 0 to 2 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Thin mantle of silty material and the underlying lacustrine deposits and clayey till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Swygert and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have no subsurface layer and are lighter colored in the upper part of the subsoil
- Soils that contain more silt and less clay in the subsoil
- Soils that have a seasonal high water table at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Swygert soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Thorp Series

Drainage class: Poorly drained
Permeability: Slow
Landform: Outwash plains, stream terraces, and till plains
Parent material: Silty material and the underlying loamy outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Argiaquic Argialbolls

Typical Pedon for MLRA 110

Typical pedon of Thorp silt loam, 0 to 2 percent slopes, at an elevation of 615 feet, 750 feet south and 1,935 feet east of the northwest corner of sec. 30, T. 30 N., R. 4 E., in Livingston County; USGS Streator South topographic quadrangle; lat. 41 degrees 2 minutes 47 seconds N. and long. 88 degrees 48 minutes 25 seconds W., NAD 27:

Ap—0 to 11 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; few very fine roots; moderately acid; abrupt smooth boundary.

Eg—11 to 15 inches; gray (10YR 6/1) silt loam, light brownish gray (10YR 6/2) dry; weak thin platy structure; friable; few very fine roots; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Btg1—15 to 22 inches; gray (10YR 5/1) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Btg2—22 to 30 inches; gray (10YR 5/1) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Btg3—30 to 36 inches; gray (10YR 6/1) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; moderately acid; clear smooth boundary.

Btg4—36 to 41 inches; gray (10YR 6/1) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; friable; few very fine roots; few faint light brownish gray (10YR 6/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; moderately acid; gradual smooth boundary.

2Btg5—41 to 49 inches; gray (10YR 6/1) sandy clay loam; weak fine prismatic structure; friable; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; moderately acid; clear smooth boundary.

2Cg—49 to 60 inches; gray (10YR 6/1), stratified sandy loam and silty clay loam; massive; friable; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; neutral.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 14 inches
Thickness of the silty material: 30 to 54 inches
Depth to carbonates: More than 40 inches
Thickness of the solum: 40 to 65 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silt loam

2Btg horizon:
Hue—10YR, 2.5Y, or 5Y

Value—4 to 6
Chroma—1 to 6
Texture—clay loam, loam, silt loam, sandy loam, or sandy clay loam

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—loam, silt loam, sandy loam, sandy clay loam, or clay loam

206A—Thorp silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains, stream terraces, and till plains
Position on the landform: Toeslopes and depressions

Soil Properties and Qualities

Drainage class: Poorly drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Thorp and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have a thinner surface layer
- Soils that have no subsurface layer
- Soils that contain till in the lower part of the subsoil
- Soils that contain sandy and gravelly deposits in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein, Mundelein, Millstream, and Wauconda soils in the higher positions on the landform
- Loamy Orthents in positions on the landform similar to those of the Thorp soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Varna Series

Drainage class: Moderately well drained
Permeability: Slow
Landform: Moraines and till plains
Parent material: Thin mantle of silty material and the underlying silty clay loam till
Slope range: 2 to 6 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Argiudolls

Taxadjunct features: The Varna soil in map unit 223C2 (Varna silt loam, 4 to 6 percent slopes, eroded) has a mollic epipedon less than 10 inches thick. This soil is classified as a fine, illitic, mesic Oxyaquic Hapludalf.

Typical Pedon for MLRA 110

Typical pedon of Varna silt loam, 2 to 4 percent slopes, at an elevation of 722 feet, 35 feet north and 3,525 feet west of the southeast corner of sec. 6, T. 29 N., R. 11 E., in Kankakee County; USGS West Kankakee topographic quadrangle; lat. 41 degrees 0 minutes 57 seconds N. and long. 88 degrees 59 minutes 12 seconds W., NAD 27:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.
A—8 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.
2Bt1—12 to 18 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; firm; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; 5 percent fine gravel; moderately acid; clear smooth boundary.
2Bt2—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay; weak fine prismatic structure parting to moderate very fine and fine subangular blocky; firm; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; 5 percent fine gravel; moderately acid; clear smooth boundary.
2Bt3—24 to 30 inches; light olive brown (2.5Y 5/4) silty clay; weak fine prismatic structure parting to moderate fine angular and subangular blocky; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many fine prominent

yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent fine gravel; neutral; clear wavy boundary.

2Bt4—30 to 42 inches; 60 percent yellowish brown (10YR 5/6) and 40 percent grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium angular and subangular blocky; firm; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; 5 percent fine gravel; slightly effervescent; slightly alkaline; gradual smooth boundary.

2BCt—42 to 48 inches; 50 percent yellowish brown (10YR 5/6) and 50 percent gray (5Y 5/1) silty clay loam; weak medium prismatic structure parting to weak medium subangular and angular blocky; firm; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; 2 percent fine gravel; slightly effervescent; moderately alkaline; gradual wavy boundary.

2Cd—48 to 60 inches; 90 percent yellowish brown (10YR 5/4 and 5/6) and 10 percent gray (5Y 5/1) silty clay loam; massive; very firm; 5 percent fine gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 16 inches
Thickness of the silty material: Less than 18 inches
Depth to carbonates: 24 to 40 inches
Thickness of the solum: 24 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay

2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam, silty clay, or clay loam

223B—Varna silt loam, 2 to 4 percent slopes

Setting

Landform: Moraines and till plains
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Varna and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are moderately eroded
- Soils that contain more sand in the upper one-half of the profile
- Soils that contain less clay in the subsoil
- Soils that have a seasonal high water table at a depth of more than 3.5 feet or less than 2.0 feet
- Soils that have slopes of more than 4 percent

Dissimilar soils:
- The poorly drained Ashkum soils and very poorly drained Peotone soils in depressions and drainageways
- Clayey Orthents in positions on the landform similar to those of the Varna soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

223C2—Varna silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Moraines and till plains
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained

Parent material: Thin mantle of silty material and the underlying silty clay loam till

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Varna and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are severely eroded
- Soils that contain more sand in the upper one-half of the profile
- Soils that have a seasonal high water table at a depth of more than 3.5 feet or less than 2.0 feet
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that contain less clay in the subsoil

Dissimilar soils:
- The poorly drained Ashkum and very poorly drained Peotone soils in depressions and drainageways
- Calcareous soils in positions on the landform similar to those of the Varna soil
- Clayey Orthents in positions on the landform similar to those of the Varna soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Warsaw Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains, stream terraces, and kames
Parent material: Loamy drift over sandy and gravelly deposits
Slope range: 4 to 6 percent

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls

Taxadjunct features: The Warsaw soils in this survey area have a mollic epipedon less than 10 inches thick. They are classified as fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Mollic Hapludalfs.

Typical Pedon for MLRA 110

Typical pedon of Warsaw silt loam, 0 to 2 percent slopes, at an elevation of 535 feet, 1,800 feet south and 620 feet west of the northeast corner of sec. 9, T. 33 N., R. 9 E., in Will County; USGS Wilmington topographic quadrangle; lat. 41 degrees 21 minutes 25 seconds N. and long. 88 degrees 11 minutes 42 seconds W., NAD 27:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many very fine roots; 2 percent gravel; slightly acid; clear smooth boundary.

A—7 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; many very fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; 2 percent gravel; slightly acid; clear smooth boundary.

2BA—11 to 17 inches; brown (10YR 4/3) loam; moderate fine subangular blocky structure; friable; many very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 5 percent gravel; moderately acid; clear smooth boundary.

2Bt1—17 to 28 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 5 percent gravel; moderately acid; clear wavy boundary.

3Bt2—28 to 32 inches; dark yellowish brown (10YR 4/4) gravelly sandy clay loam; weak fine and medium subangular blocky structure; friable; common very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 20 percent gravel; neutral; clear wavy boundary.

3C1—32 to 44 inches; yellowish brown (10YR 5/4) gravelly loamy sand; massive; very friable; few very fine roots; 20 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

3C2—44 to 80 inches; light yellowish brown (10YR 6/4) very gravelly sand; single grain; loose; 40 percent gravel; strongly effervescent; slightly alkaline.

MLRA Series Range in Characteristics

Depth to sandy and gravelly deposits: 24 to 40 inches
Depth to carbonates: 24 to 40 inches
Thickness of the solum: 24 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or loam

2Bt or 3Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—clay loam, loam, sandy clay loam, or the gravelly analogs of these textures
Content of gravel—0 to 35 percent

3C horizon:
Hue—7.5YR or 10YR
Value—5 or 6
Chroma—3 to 6
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, coarse sand, or loamy coarse sand
Content of gravel—15 to 70 percent

290C2—Warsaw silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Outwash plains, stream terraces, and kames
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Loamy drift over sandy and gravelly deposits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Warsaw and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that have slopes of less than 4 percent
- Soils that contain sandy and gravelly deposits at a depth of more than 40 inches or less than 24 inches
- Soils that contain less sand and more silt in the upper one-half of the profile
- Soils that contain till in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein soils in the lower positions on the landform
- The poorly drained Dunham soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Warsaw soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Wauconda Series

Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Silty material and the underlying stratified loamy outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs

Typical Pedon for MLRA 110

Typical pedon of Wauconda silt loam, 0 to 2 percent slopes, at an elevation of 778 feet, 1,780 feet north and 2,640 feet west of the southeast corner of sec. 13, T. 45 N., R. 10 E., in Lake County; USGS Antioch topographic quadrangle; lat. 42 degrees 22 minutes 34 seconds N. and long. 88 degrees 0 minutes 55 seconds W., NAD 27:

Ap—0 to 9 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to weak medium granular; friable; common very fine roots; neutral; clear smooth boundary.
E—9 to 14 inches; dark gray (2.5Y 4/1) silt loam; weak fine and medium subangular blocky structure parting to moderate fine and medium granular; friable; common very fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; neutral; clear smooth boundary.
Bt1—14 to 23 inches; brown (10YR 4/3) silty clay loam; weak medium prismatic structure parting to

moderate fine and medium subangular blocky; friable; common very fine roots; common distinct very dark gray (10YR 3/1) organo-clay films and dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine and medium distinct olive brown (2.5Y 4/4) and few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt2—23 to 30 inches; light olive brown (2.5Y 5/4) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; few distinct olive brown (2.5Y 4/3) clay films on faces of peds; common fine black (2.5Y 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common fine and medium distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—30 to 38 inches; light olive brown (2.5Y 5/3), stratified sandy loam and silt loam; weak medium subangular blocky structure; very friable; common fine black (2.5Y 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 10 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2C1—38 to 41 inches; light olive brown (2.5Y 5/4) loamy coarse sand; single grain; loose; 13 percent gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2C2—41 to 60 inches; brown (10YR 5/3), stratified silt loam and sandy loam; firm; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent gravel; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

E horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

2BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silt loam, loam, sandy loam, or fine sandy loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—stratified silt loam to very fine sand

697A—Wauconda silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Footslopes

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Wauconda and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that contain loamy outwash at a depth of more than 40 inches
- Soils that have carbonates at a depth of less than 20 inches or more than 40 inches
- Soils that contain till in the lower part of the profile
- Soils that have a darker subsurface layer
- Soils that have a lighter colored surface layer
- Soils that have a seasonal high water table at a depth of more than 2 feet

Dissimilar soils:
- The poorly drained Drummer and Thorp soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Wauconda soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Waupecan Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains, stream terraces, and kames
Parent material: Silty material and the underlying loamy and gravelly outwash
Slope range: 2 to 4 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Argiudolls

Typical Pedon for MLRA 110

Typical pedon of Waupecan silt loam, 2 to 4 percent slopes, at an elevation of 775 feet, 2,120 feet south and 720 feet west of the northeast corner of sec. 20, T. 40 N., R. 9 E., in Du Page County; USGS West Chicago topographic quadrangle; lat. 41 degrees 56 minutes 16 seconds N. and long. 88 degrees 13 minutes 38 seconds W., NAD 27:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate very fine and fine granular structure; friable; common very fine roots; slightly acid; clear smooth boundary.

A—7 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to moderate very fine and fine granular; friable; common very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—11 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—14 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; common distinct dark brown (10YR 3/3) organo-clay films and many distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt3—24 to 35 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; common distinct dark brown (10YR 3/3) organo-clay films and brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt4—35 to 39 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common very fine and fine roots; many distinct very dark grayish brown (10YR 3/2) organo-clay films and few distinct brown (10YR 4/3) clay films on faces of peds; 2 percent gravel; neutral; clear wavy boundary.

2BCt—39 to 45 inches; brown (10YR 4/3) gravelly loam; weak medium subangular blocky structure; friable; few distinct dark brown (10YR 3/3) organo-clay films on faces of peds; 25 percent gravel and 5 percent cobbles; slightly effervescent; slightly alkaline; gradual wavy boundary.

3C—45 to 60 inches; dark yellowish brown (10YR 4/4) very gravelly loamy sand; single grain; loose; 45 percent gravel and 10 percent cobbles; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the silty material: 24 to 48 inches
Depth to sandy and gravelly deposits: 40 to 60 inches
Depth to carbonates: 24 to 48 inches
Thickness of the solum: 40 to 72 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2BCt horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—3 to 6
Texture—clay loam, sandy clay loam, loam, sandy loam, loamy sand, or the gravelly analogs of these textures
Content of gravel—0 to 35 percent

3C horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—3 to 6
Texture—gravelly loamy sand to extremely gravelly coarse sand
Content of gravel—15 to 70 percent
Content of cobbles—5 to 35 percent

369B—Waupecan silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains, stream terraces, and kames
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Silty material and the underlying loamy and gravelly outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Waupecan and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that contain sandy and gravelly deposits at a depth of less than 40 inches or more than 60 inches
- Soils that have no subsurface layer
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils in the lower positions on the landform
- The poorly drained Dunham soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Waupecan soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Zurich Series

Drainage class: Moderately well drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Silty material and the underlying loamy outwash
Slope range: 2 to 6 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Typical Pedon for MLRA 110

Typical pedon of Zurich silt loam, 2 to 4 percent slopes, at an elevation of 640 feet, 300 feet north and 2,260 feet east of the southwest corner of sec. 23, T. 43 N., R. 11 E., in Lake County; USGS Wheeling topographic quadrangle; lat. 42 degrees 10 minutes 58 seconds N. and long. 87 degrees 55 minutes 1 second W., NAD 27:

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine and fine roots; neutral; clear smooth boundary.
E—5 to 9 inches; 60 percent dark grayish brown (10YR 4/2) and 40 percent brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; weak medium platy structure parting to weak fine subangular blocky; friable; few very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.
BE—9 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; friable; few very fine and fine roots; few distinct light brownish gray (10YR 6/2 dry) silt coatings on faces of peds; few distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.
Bt1—16 to 23 inches; brown (7.5YR 4/4) silty clay

loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; few distinct light brownish gray (10YR 6/2 dry) silt coatings on faces of peds; many distinct brown (7.5YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—23 to 28 inches; brown (7.5YR 4/4) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct brown (7.5YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

2Bt3—28 to 31 inches; brown (7.5YR 4/3) loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct brown (7.5YR 4/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) iron depletions in the matrix; very slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—31 to 38 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; friable; few very fine roots; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium distinct yellowish brown (10YR 5/6) and brown (7.5YR 4/4) masses of iron accumulation in the matrix; many medium coarse distinct light brownish gray (10YR 6/2) iron depletions in the matrix; slightly effervescent; moderately alkaline; gradual smooth boundary.

2C—38 to 64 inches; 70 percent yellowish brown (10YR 5/4 and 5/6) and 30 percent light brownish gray (10YR 6/2), stratified silt loam and very fine sandy loam; massive; friable; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine and medium white (10YR 8/1) carbonate concretions throughout; strongly effervescent; moderately alkaline.

MLRA Series Range in Characteristics

Thickness of the silty material: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

Bt or BE horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silt loam, loam, sandy loam, or fine sandy loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—stratified silt loam to very fine sand

696B—Zurich silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits, shoulders, and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the “Soil Properties” section in Part II of this publication.

Composition

Zurich and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that contain loamy outwash at a depth of more than 40 inches
- Soils that have carbonates at a depth of less than 20 inches or more than 40 inches
- Soils that contain till in the lower part of the profile
- Soils that have a thicker surface layer
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Drummer and Thorp soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Zurich soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

696C2—Zurich silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Shoulders and backslopes

Soil Properties and Qualities

Drainage class: Moderately well drained
Parent material: Silty material and the underlying loamy outwash

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the "Soil Properties" section in Part II of this publication.

Composition

Zurich and similar soils: 85 percent
Dissimilar soils: 15 percent

Similar soils:
- Soils that are severely eroded
- Soils that contain loamy outwash at a depth of more than 40 inches
- Soils that contain till in the lower part of the profile
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have carbonates at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The poorly drained Drummer and Thorp soils in depressions and drainageways
- Loamy Orthents in positions on the landform similar to those of the Zurich soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Soil Survey of
Du Page County, Illinois—Part II

By Dale E. Calsyn, Natural Resources Conservation Service

Original fieldwork by J.L. Alexander, T.M. Goddard, D.R. Mapes, J.E. Paschke, D.L. Smith, B.G. Stewart, and R.D. Windhorn, Soil Conservation Service

Update fieldwork by Dale E. Calsyn, LeAnn S. Colburn, Jeffrey A. Deniger, and Karla D. Hanson, Natural Resources Conservation Service

Map compilation by Dale E. Calsyn, LeAnn S. Colburn, Jeffrey A. Deniger, Karla D. Hanson, Ellen M. Starr, and Michael B. Walker, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Du Page County Board and the Illinois Agricultural Experiment Station

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey

can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Climate information for the survey area is provided in tables 1, 2, and 3 at the back of Part II. The classification and extent of the soils in the survey area are shown in tables 4 and 5.

Agronomy

General management needed for crops and for hay and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider obtaining specific information from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

The demand for food and fiber has increased in recent years along with the number of residential tracts. In 1992, Du Page County had only about 15,984 acres of cropland (U.S. Department of Commerce, 1992). Agriculture is still an important land use in the county. The major row crops are corn and soybeans. Some vegetables, sod, and nursery crops also are grown. Alfalfa is the major forage crop.

The soils in Du Page County have good potential for continued crop production, especially if the latest crop production technology is applied. This soil survey can be used as a guide for applying the latest crop production technologies.

The major management concerns affecting cropland in the county are water erosion, restricted permeability, wetness, ponding, surface crusting, poor tilth, and excessive permeability.

Erosion is a potential problem on approximately 55 percent of the cropland in the county. Erosion can be a problem on soils that have slopes of more than 2 percent, such as Barrington, Markham, and Waupecan soils.

Loss of the surface layer is damaging for several reasons. Soil productivity is reduced as the surface soil is removed and part of the subsoil is incorporated into the plow layer. The subsoil is generally lower in plant nutrients, lower in organic matter, and higher in clay content compared to the surface soil. As the content of organic matter in the plow layer is reduced and the content of clay is increased, soil tilth deteriorates. As a result, the surface is subject to crusting and the rate of water infiltration is reduced. Erosion results in the sedimentation of streams, rivers, road ditches, and lakes. This sedimentation has a negative impact on the quality of water for agricultural, municipal, and recreational uses and for fish and wildlife. Removing the sediment generally is expensive. Erosion control helps to minimize this pollution and improves water quality.

Erosion-control measures include both cultural and structural practices. The most widely used practices in the county are conservation tillage systems, such as mulch tillage and zero tillage. These systems can leave from 30 to 90 percent of the surface covered with crop residue. Another cultural practice is a crop rotation that includes one or more years of close-growing grasses or legumes. In areas where slopes are smooth and uniform, terraces and contour farming are also effective in controlling erosion.

Structural practices are needed in drainageways where concentrated runoff flows overland. Erosion can be controlled by establishing grassed waterways or erosion-control structures.

Further information about erosion-control measures suitable for each kind of soil is provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Restricted permeability can increase the susceptibility to erosion. As water movement slows within a soil, the rate of runoff increases. The slowly permeable Ozaukee soils have a higher erodibility potential than the moderately permeable Zurich soils. The effect of restricted permeability on the hazard of erosion can be controlled by using a cropping system that leaves crop residue on the surface after planting, incorporating green manure crops or crop residue into the soil, and using conservation cropping systems.

Restricted permeability can also limit the effectiveness of drainage systems. In areas of the slowly permeable Thorp soils, a narrower tile spacing is needed to lower the water table than in areas of the moderately permeable Drummer soils.

Drainage systems have been installed in most areas of poorly drained and somewhat poorly drained soils used as cropland in the county. As a result, these soils are adequately drained for the commonly grown crops. Measures that maintain the drainage system are needed. Poorly drained soils, such as Ashkum,

Drummer, and Dunham soils, have subsurface drainage. Also, in some areas of poorly drained soils, surface tile inlets or shallow surface ditches are needed to remove excess water. Unless artificial drainage is provided, some areas of somewhat poorly drained soils are wet for long enough periods in some years that productivity is hampered. Somewhat poorly drained soils, such as Elliott, Martinton, and Mundelein soils, have subsurface drainage.

Soil tilth is an important factor influencing the germination of seeds, the amount of runoff, and the rate of water infiltration. Soils that have good tilth are granular and porous and have a high content of organic matter.

Surface crusting can be a problem in areas of Blount and Ozaukee soils, which have a surface layer of silt loam that is low in organic matter. Generally, the structure of these soils is weak, and a crust forms on the surface during periods of intense rainfall. This crust is hard when dry. It inhibits seedling emergence, reduces the infiltration rate, and increases the runoff rate and the hazard of erosion. Regular additions of crop residue, manure, and other organic material improve soil structure and minimize crusting.

Poor tilth is also a problem on soils that have a surface layer of silty clay loam, such as Drummer and Milford soils. If these poorly drained soils are plowed when wet, the surface layer can become cloddy. This cloddiness hinders the preparation of a good seedbed. Tilling in the fall and leaving the soil surface rough and covered with a moderate amount of crop residue generally result in good tilth in the spring. A system of strip or ridge tillage may also work well on these soils.

Soils that are excessively permeable, such as Fox and Waupecan soils, are subject to ground-water contamination. These soils contain sandy and gravelly deposits within a depth of 60 inches and are very rapidly permeable in the lower part of the profile.

Several measures can be used to limit the deep leaching of nutrients and pesticides. Applications of fertilizer should be based on the results of soil tests. The local office of the Cooperative Extension Service can help in determining the kinds and proper amounts of nutrients needed. Chemicals should be selected based on their solubility in water, their ability to bind with the soil, and the rate at which they break down in the soil. Splitting chemical applications, particularly applications of nitrogen, is beneficial. This practice reduces the chance for excessive leaching from a one-time application. Planting legumes in a crop rotation or as a cover crop adds nitrogen to the soil, thereby reducing the amount of nitrogen needed in chemical applications. A system of crop rotation is also effective in controlling weeds and insects and thus reduces the amount of herbicides and insecticides needed per application. Finally, the use of small grain cover crops following fertilized corn crops can be effective in taking up some residual nitrogen from the soil.

Proper management is needed on hayland to prolong the life of desirable forage species, to maintain or improve the quality and quantity of forage, and to control erosion and reduce the runoff rate. Hay crops can remain vigorous for 4 to 5 years, depending on management and on the varieties seeded. Suitable hay plants include several legumes and cool-season grasses. Alfalfa is the most common legume grown for hay. It is often used in mixtures with smooth bromegrass and orchardgrass. Alfalfa is best suited to moderately well drained and well drained soils, such as Grays and Rush soils. Red clover is also grown for hay. Measures that maintain or improve fertility are needed. The amount of lime and fertilizer to be added should be based on the results of soil tests, the needs of the plants, and the expected level of yields. Seed varieties should be selected in accordance with the soil properties and the drainage conditions of the tract of land.

Cropland Management Considerations

The management concerns affecting the use of the detailed soil map units in the survey area for crops are shown in table 6. The main concerns in managing cropland are controlling water erosion, soil wetness, and ponding; limiting the effects of restricted or excessive permeability; minimizing surface crusting; and improving poor tilth.

Generally, a combination of several practices is needed to control *water erosion*. Conservation tillage, stripcropping, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss.

Wetness is a limitation in some areas of cropland, and *ponding* is a hazard. Drainage systems consist of subsurface tile drains, surface inlet tile, open drainage ditches, or a combination of these. Measures that maintain the drainage system are needed.

Restricted permeability can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems.

Excessive permeability can cause deep leaching of

nutrients and pesticides. Selecting appropriate chemicals and using split application methods reduce the hazard of ground-water contamination.

Practices that reduce *surface crusting* and improve *poor tilth* include incorporating green manure crops, manure, or crop residue into the soil and using a system of conservation tillage. Surface cloddiness can be controlled by avoiding tillage when the soil is too wet.

Some of the considerations shown in the table cannot be easily overcome. These are *depth to bedrock, flooding,* and *subsidence*.

The considerations included in the table are as follows:

Depth to bedrock.—Rooting depth and available moisture may be limited by bedrock within a depth of 30 inches.

Excessive lime.—This limitation can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer in areas where the soils have a high content of lime.

Flooding.—Winter small grain crops can be damaged. Tilling and planting should be delayed in the spring until flooding is no longer a hazard.

Low available water capacity.—This limitation can be minimized by reducing the evaporation and runoff rates and increasing the rate of water infiltration. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

Stony.—Stones on or near the surface can hinder normal tillage unless they are removed.

Subsidence.—Subsidence occurs as a result of shrinkage from drying, consolidation because of the loss of ground water, compaction from tillage, wind erosion, burning, and biochemical oxidation. Limiting the amount of drainage, avoiding excessive tillage, deferring tillage when the soil is wet, and using a system of conservation tillage that leaves crop residue on the surface after planting help to control subsidence.

Wind erosion.—Using a system of conservation tillage that leaves crop residue on the surface after planting and keeping the surface rough help to control wind erosion.

The criteria used to determine the limitations or hazards are as follows:

Crusting.—The organic matter content is less than 2.5 percent, and the clay content is more than 20 percent.

Depth to bedrock.—The depth to bedrock is less than 30 inches.

Excessive lime.—The calcium carbonate equivalent is 15 percent or more and meets the calcic horizon classification criteria.

Excessive permeability.—Permeability is 6 inches per hour or more within the soil profile.

Flooding.—The soil is subject to occasional or frequent flooding.

Gravelly.—The content of gravel in the surface layer is more than 15 percent.

Low available water capacity.—The weighted average of the available water capacity between the surface and a depth of 40 inches is 0.1 inch or less.

Low pH.—Soil reaction (pH) is less than 4.5.

Ponding.—The water table is above the surface.

Poor tilth.—The soil has more than 27 percent clay in the surface layer.

Restricted permeability.—Permeability is less than 0.2 inch per hour between the surface and a depth of 40 inches.

Stony.—The content of stones in the surface layer is more than 15 percent.

Subsidence.—The decrease in surface elevation is more than 0 inches.

Water erosion.—The K factor in the surface layer multiplied by the slope is 0.8 or more, and the slope is 3 percent or more.

Wetness.—The soil has a water table within a depth of 1.5 feet.

Wind erosion.—The wind erodibility group (WEG) is 1 or 2.

Crop Yield Estimates

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 7. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents (Fehrenbacher and others, 1978). Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage,

erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Pasture and Hayland Interpretations

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in table 7.

Pasture Limitations and Hazards

Growing legumes, cool-season grasses, and warm-season grasses that are suited to the soils and the climate of the area helps to maintain a productive stand of pasture.

The management concerns affecting the use of the soils in the survey area for pasture are shown in table 8. The major management concerns affecting pasture are water erosion, soil fertility, low available water capacity, low pH, and equipment limitations.

Pastureland soils that are susceptible to water erosion meet the following criteria: The K factor multiplied by the slope is greater than 0.8, and the slope is 3 percent or more. Water erosion reduces the productivity of pastureland. It also results in onsite and offsite sedimentation, causes water pollution, and increases the runoff of livestock manure and other added nutrients.

Measures that are effective in controlling water erosion include establishing or renovating stands of legumes and grasses. Controlling erosion during seedbed preparation is a major concern. If the soil is tilled for the reseeding of pasture or hay crops, planting winter cover crops, establishing grassed waterways, farming on the contour, and using a system of conservation tillage that leaves a protective cover of crop residue on the surface can help to minimize erosion.

Wetness is a limitation in some pastured areas. Drainage systems consist of subsurface tile drains, surface inlet tile, open drainage ditches, or a combination of these. Measures that maintain the drainage system are needed.

Overgrazing or grazing when the soil is wet reduces the extent of plant cover and results in surface compaction and poor tilth. These conditions can increase the hazard of erosion. Proper stocking rates, rotation grazing, and timely deferment of grazing, especially during wet periods, help to keep the pasture in good condition. The proper location of livestock watering facilities helps to prevent surface compaction or the formation of ruts by making it unnecessary for cattle to travel long distances up and down the steep slopes.

Soils that have low fertility meet the following criteria: The average content of organic matter in the surface layer is less than 1 percent, and the cation-exchange capacity is equal to or less than 7 milliequivalents per 100 grams of soil. Low fertility levels affect the health and vigor of the plants and thus have a direct impact on the quantity and quality of livestock produced. Additions of fertilizers and other organic material should be based on the results of soil tests, on the needs of specific plant species, and on the desired level of production.

Soils that have low pH, or low reaction, have a pH value equal to or less than 5.5 in the surface layer. Low soil reaction inhibits the uptake of certain nutrients by the plants or accelerates the absorption of certain other elements to the level of toxic concentrations. Either of these conditions affects the health and vigor of plants. Applications of lime should be based on the results of soil tests. The goal is to

achieve the optimum pH level for the uptake of the major nutrients by the specific grass, legume, or combination of grasses and legumes.

Available water capacity is low when it is a weighted average of less than 0.10 inch of water per inch of soil within a depth of 40 inches or when it is a weighted average of less than 3 inches in the root zone if the root zone is less than 40 inches thick. Available water capacity refers to the capacity of soils to hold water available for use by most plants. The quality and quantity of pasture plants may be reduced if the available water is inadequate for the maintenance of a healthy community of desired pasture species and, thus, the desired number of livestock. A poor quality pasture may increase the hazard of erosion and increase the runoff of pollutants. Planting drought-resistant species of grasses and legumes helps to establish a cover of vegetation. Irrigation may be needed.

In areas where slopes are 10 percent or more, the use of farm equipment may be restricted.

In areas where the soils have more than 15 percent gravel in the surface layer, seedbed preparation and renovation practices may be hindered. The cobbles and stones can be removed or piled in a corner of the field.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not take into account major and generally expensive landshaping that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils generally are grouped at three levels—capability class, subclass, and unit (USDA, 1961). These categories indicate the degree and kinds of limitations affecting mechanized farming systems that produce the more commonly grown field crops, such as corn, small grain, cotton, hay, and field-grown vegetables. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use.

If properly managed, soils in classes 1, 2, 3, and 4 are suitable for the mechanized production of commonly grown field crops and for pasture and woodland. The degree of the soil limitations affecting the production of cultivated crops increases progressively from class 1 to class 4. The limitations can affect levels of production and the risk of permanent soil deterioration caused by erosion and other factors.

Soils in classes 5, 6, and 7 are generally not suited to the mechanized production of commonly grown field crops without special management, but they are suitable for plants that provide a permanent cover, such as grasses and trees. The severity of the soil limitations affecting crops increases progressively from class 5 to class 7.

Areas in class 8 are generally not suitable for crops, pasture, or woodland without a level of management that is impractical. These areas may have potential for other uses, such as recreational facilities and wildlife habitat.

Capability subclasses identify the dominant kind of limitation in the class. They are designated by adding a small letter, *e, w, s,* or *c*, to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class 1 because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use mainly to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of the map units in the survey area is given in table 7.

Prime Farmland

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. An adequate moisture supply and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They either are used for food and fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils commonly receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable, and the level of acidity or alkalinity and the content of salts and sodium are acceptable. The soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods, and they are not frequently flooded during the growing season or are protected from flooding. Slopes range mainly from 0 to 6 percent.

Soils that have a high water table or are subject to flooding may qualify as prime farmland where these limitations are overcome by drainage measures or flood control. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information about the criteria for prime farmland can be obtained at the local office of the Natural Resources Conservation Service.

In the past two decades, there has been a rapid conversion of prime farmland in Du Page County to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

The map units in the survey area that meet the requirements for prime farmland are listed in table 9. This list does not constitute a recommendation for a particular land use. On some soils included in the table, measures that overcome limitations are needed. The need for these measures is indicated in parentheses after the map unit name. The location of each map unit is shown on the detailed soil maps. The soil qualities that affect use and management are described in the section “Soil Series and Detailed Soil Map Units” in Part I of this publication.

Erosion Factors

Soil erodibility (K) and soil-loss tolerance (T) factors are used in an equation that predicts the amount of soil lost through water erosion in areas of cropland. The procedure for predicting soil loss is useful in guiding the selection of soil and water conservation practices. The erosion factors for the soils in the survey area are listed in table 19.

Soil Erodibility (K) Factor

The soil erodibility (K) factor indicates the susceptibility of a soil to sheet and rill erosion by water. The soil properties that influence erodibility are those that affect the infiltration rate, the movement of water through the soil, and the water storage capacity of the soil and those that allow the soil to resist dispersion, splashing, abrasion, and the transporting forces of rainfall and runoff. The most important soil properties are the content of silt plus very fine sand, the content of sand coarser than very fine sand, the content of organic matter, soil structure, and permeability.

Fragment-Free Soil Erodibility (Kf) Factor

This is one of the factors used in the Revised Universal Soil Loss Equation. It shows the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Soil-Loss Tolerance (T) Factor

The soil-loss tolerance (T) factor is an estimate of the maximum annual rate of soil erosion that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons of soil loss per acre per year. Ratings of 1 to 5 are used, depending on soil properties and prior erosion. The criteria used in assigning a T factor to a soil include maintenance of an adequate rooting depth for crop production, potential reduction of crop yields, maintenance of water-control structures affected by sedimentation, prevention of gullying, and the value of nutrients lost through erosion.

Wind Erodibility Groups

Wind erodibility is directly related to the percentage of dry, nonerodible surface soil aggregates larger than 0.84 millimeter in diameter. From this percentage, the wind erodibility index (I) factor is determined. This factor is an expression of the stability of the soil aggregates, or the extent to which they are broken down by tillage and the abrasion caused by windblown soil particles. Soils are assigned to wind erodibility groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 millimeter. The wind erodibility groups and wind erodibility index numbers are listed in table 19.

Additional information about wind erodibility groups and K, Kf, T, and I factors can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low-and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Windbreaks are often planted on land that did not originally support trees. Knowledge of how trees perform on such land can be gained only by observing and recording the performance of trees that have been planted and have survived. Many popular windbreak species are not indigenous to the areas in which they are planted.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters, a tree or shrub may grow well or grow poorly, depending on the characteristics of the soil. Each tree or shrub has definable potential heights in a given physiographic area and under a given climate. Accurate definitions of potential heights are necessary when a windbreak is planned and designed.

Table 10 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in this table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a nursery.

Forestland

Wayne A. Lampa and Daniel R. Ludwig, Ph.D., of the Forest Preserve District of Du Page County, helped prepare this section.

Before it was settled, forest covered nearly 29,000 acres in Du Page County. At the time of settlement, the upland oak and maple groves of the county were very restricted in distribution and very open in nature. The first settlers to enter the area in the 1830's reported that trees were so scattered and the woody understory so sparse that a wagon could easily be driven through the woods. This condition was attributed to naturally occurring fires and fires set annually by Native Americans to maintain the open character of these ecosystems. Within a generation after these fires were stopped, the forests had filled with brush and small trees. The need for building materials, firewood, and road planks in the mid 1800's decimated the forests of the county. The end products of this process are declining, even-aged, nearly monotypic stands of mature oaks with a dense understory of brush and small trees.

Along with settlement of the county, there was a marked shift in the composition of forests. The oaks, hickories, and ashes that made up the majority of trees in the past are now being replaced by other native and non-native trees.

Prior to settlement, Du Page County also had 27,000 acres of savanna. These wooded prairie groves have since been fragmented into woodlots and small woodlands by farming and urban development. As a result, much of the seed source has been isolated and the potential for natural restoration has been reduced.

Most of the forestland in the county could be greatly improved with proper management measures. A forester or natural resource specialist can help in the establishment, improvement, or management of woodland sites. The forests in Du Page County are not only aesthetically pleasing, but they also protect and enhance watershed quality, recreation, and wildlife habitat.

Table 11 can be used by forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

In the table, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed also are subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under

normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Suggested trees to plant are those that are suitable for commercial wood production.

Recreation

Du Page County offers a wide variety of recreational facilities. As a result of a major land acquisition program during the 1970's and 1980's, the Forest Preserve District of Du Page County now owns and manages numerous tracts of land throughout the county (fig. 4). Various outdoor activities are available to the public, including boating, fishing, hiking, biking, horseback riding, camping, picnicking, flying model aircraft, cross-country skiing, ice skating, ice fishing, and snow tubing. The Fermi National Laboratory offers similar recreational opportunities on its property. Also, most municipalities offer a variety of recreational facilities and activities, such as playgrounds, swimming pools, and golf courses.

Du Page County has a network of bicycle trails. The Illinois Prairie Path and Great Western Trail are two of the more extensive trails crossing the county.

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites, and either access to public sewer lines or the capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited in varying degrees for recreational uses by the duration of flooding and the season when it occurs. Onsite assessment of the height, duration, intensity, and frequency of flooding is essential in planning recreational facilities.

Camp areas are tracts of land used intensively as sites for tents, trailers, and campers and for outdoor activities that accompany such sites. These areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The soils are rated on the basis of soil properties that influence the ease of developing camp areas and performance of the areas after development. Also considered are the soil properties that influence trafficability and promote the growth of vegetation after heavy use.

Picnic areas are natural or landscaped tracts of land that are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation after development. The surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Playgrounds are areas used intensively for baseball, football, or similar activities. These areas require a nearly level soil that is free of stones and that can withstand heavy foot traffic and maintain an adequate cover of vegetation. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation. Slope and stoniness are the main concerns in developing playgrounds. The surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Paths and trails are areas used for hiking and horseback riding. The areas should require little or no cutting and filling during site preparation. The soils are rated on the basis of soil properties that influence trafficability and erodibility. Paths and trails should remain firm under foot traffic and not be dusty when dry.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

The interpretive ratings in this table help engineers, planners, and others to understand how soil properties

Figure 4.—The numerous forest preserves in Du Page County provide many outdoor recreational opportunities.

influence recreational uses. Ratings for proposed uses are given in terms of limitations. Only the most restrictive features are listed. Other features may limit a specific recreational use.

The degree of soil limitation is expressed as slight, moderate, or severe.

Slight means that soil properties are favorable for the rated use. The limitations are minor and can be easily overcome. Good performance and low maintenance are expected.

Moderate means that soil properties are moderately favorable for the rated use. The limitations can be overcome or modified by special planning, design, or maintenance. During some part of the year, the expected performance may be less desirable than that of soils rated *slight*.

Severe means that soil properties are unfavorable for the rated use. Examples of limitations are slope, bedrock near the surface, flooding, and a seasonal high water table. These limitations generally require major soil reclamation, special design, or intensive maintenance. Overcoming the limitations generally is difficult and costly.

The information in the table can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 14 and interpretations for septic tank absorption fields in table 15.

Wildlife Habitat

Wayne A. Lampa and Daniel R. Ludwig, Ph.D., of the Forest Preserve District of Du Page County, helped prepare this section.

In presettlement times, the survey area had approximately 28,800 acres of forest, 156,100 acres of prairie, and 26,900 acres of savanna. Approximately 128,000 acres consisted of wetlands. The plant communities that developed over the past 10,000 years provided habitats for very diverse flora and fauna.

Since the 1830's, human use of the land expanded and intensified to the extent that less than 4 percent of the historic landscape remains. Today, 90 percent of the remnants of the presettlement landscape are found in the county's forest preserves.

Despite increasing degradation and loss of habitat, wildlife persists in forest preserves, cropland, and other open spaces. Non-native and native plant communities provide habitat and necessary resources for 225 vertebrate animals (44 fish, 8 amphibians, 15 reptiles, 119 breeding birds, and 39 mammals). Canada goose, beaver, coyote, raccoon, and white-tailed deer are among the most commonly observed species in Du Page County. These species have adapted as their habitats have been changed by human development. Native aquatic plants, fish, and invertebrates are still found in several county lakes and ponds and in larger streams. These species are very vulnerable to destruction, however, as a result of even simple alteration of their water regime or chemistry and encroachment by surrounding land uses.

The continued existence of many of the county's plants and animals depends on the habitats to which they are adapted. Active management is necessary, even in an urban environment, to sustain ecosystems and the wildlife populations that rely on them for habitat.

In general, most of the remaining openland in the county is not managed primarily for wildlife. Good land management practices, however, can also improve an area's value for wildlife. For example, farming practices that leave crop residue on the fields during the fall and winter months not only help to control erosion but also provide winter cover and food for some wildlife species. Allowing grassed waterways, road ditches, fencelines, set-aside fields, and vacant properties to remain unmowed until early August provides much-needed habitat for ground-nesting wildlife, such as rabbits, pheasants, and many species of songbirds.

Development and cultivation of temporarily and seasonally flooded wetlands should be avoided. Buffer strips surrounding wetland areas provide food and nesting cover for many wildlife species and protect these areas from filling in with eroded sediment. Wetlands, streambanks, and woodlots should be fenced so that foot and vehicular traffic is prevented. Fencing can protect and maintain the native plant communities that support wildlife species. It can also help to control erosion and improve water quality in streams and rivers.

Knowledge of the soils in the area is important when efforts to restore or manage an area for wildlife are undertaken. For example, because poorly drained and very poorly drained soils have a seasonal high water table, they are most likely to support vegetation tolerant of wet conditions and thus provide habitat for wetland wildlife species. In some areas, poorly drained and very poorly drained soils have been drained by subsurface tile drains or drainage ditches. Such areas offer opportunities for wetland habitat restoration as long as negative impacts are avoided on neighboring properties.

Upland soils, once dominated by prairies and oak savannas, can also be managed in ways that promote the native plant species. This management may include planting native species, controlling or eliminating competing exotic vegetation, or using controlled fire.

Assistance with wildlife habitat projects can be obtained from various local, State, and Federal agencies, including the Illinois Department of Conservation, the U.S. Fish and Wildlife Service, the Natural Resources Conservation Service, and the local Soil and Water Conservation District.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water.

Figure 5.—An area of Muskego and Houghton mucks, undrained, 0 to 2 percent slopes. These soils are well suited to wetland wildlife habitat.

Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, soybeans, wheat, and oats.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and

features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are bromegrass, timothy, orchardgrass, clover, alfalfa, and birdsfoot trefoil.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestems, indiangrass, sideoats grama, goldenrod, lambsquarter, dandelions, partridge pea, coneflower, sunflowers, butterflyweed, and milkvetch.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, sycamore, beech, maple, hickory, green ash, crabapple, American plum, and eastern redbud. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are redosier dogwood, elderberry, winterberry, spicebush, and serviceberry.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wildrye, switchgrass, prairie cordgrass, rushes, sedges, waterplantain, beggartick, aster, and willows.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, wildlife watering developments, beaver ponds, and other ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include ring-necked pheasant, bobwhite quail, meadowlark, field sparrow, killdeer, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include thrushes, woodpeckers, owls, tree squirrels, raccoon, and white-tailed deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas, bogs, or flood plains that support water-tolerant plants (fig. 5). The wildlife attracted to this habitat include ducks, geese, herons, muskrat, beaver, frogs, and turtles.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1999) and "Keys to Soil Taxonomy" (USDA, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (USDA, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map units meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; USDA, 1996).

67A—Harpster silty clay loam, 0 to 2 percent slopes
69A—Milford silty clay loam, 0 to 2 percent slopes
125A—Selma loam, 0 to 2 percent slopes
152A—Drummer silty clay loam, 0 to 2 percent slopes
206A—Thorp silt loam, 0 to 2 percent slopes
232A—Ashkum silty clay loam, 0 to 2 percent slopes
330A—Peotone silty clay loam, 0 to 2 percent slopes
523A—Dunham silty clay loam, 0 to 2 percent slopes
848B—Drummer-Barrington-Mundelein complex, 1 to 6 percent slopes
849A—Milford-Martinton complex, 0 to 2 percent slopes
854B—Markham-Ashkum-Beecher complex, 1 to 6 percent slopes
903A—Muskego and Houghton mucks, 0 to 2 percent slopes
1107A—Sawmill silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded
1152A—Drummer silty clay loam, undrained, 0 to 2 percent slopes

1330A—Peotone silty clay loam, undrained, 0 to 2 percent slopes
1516A—Faxon silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded
1523A—Dunham silty clay loam, undrained, 0 to 2 percent slopes
1903A—Muskego and Houghton mucks, undrained, 0 to 2 percent slopes
3107A—Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded
3316A—Romeo silt loam, 0 to 2 percent slopes, frequently flooded
4904A—Muskego and Peotone soils, ponded, 0 to 2 percent slopes

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Over the last two decades, Du Page County has experienced a significant increase in population. This increase has had an important impact on land use in the county.

Urban erosion can be a major factor affecting water quality. It is estimated that the rate of urban erosion and the resulting sediment may be as much as 300 to 400 times the erosion rate in agricultural areas. Urban land under development is commonly stripped for several years without adequate erosion control (fig. 6). Soil compaction and massive earth moving are more likely to increase the hazard of erosion than seedbed preparation for crop production.

Urban erosion-control practices utilize essentially the same concepts as those applied in agricultural areas. The surface of the soil should be protected from the impact of raindrops, and the runoff from accumulated rainwater must be controlled. Effective control of erosion and sediment involves three major

Figure 6.—Areas of urban development are subject to erosion because they are not protected by ground cover.

elements. First, maintaining a permanent or temporary cover of vegetation, mulching, or using a variety of other practices can protect the soil from erosion. Second, runoff can be controlled by establishing diversions, grassed waterways or lined swales, storm sewers, or gully-control structures. Third, sediment can be captured by using sediment basins, sediment traps, and filter fences.

Erosion-control measures are most effective in combinations. The measures used and their effectiveness depend on the soil characteristics and topography. Information about the design of erosion-control measures is in the "Illinois Urban Manual," which is available in local offices of the Natural Resources Conservation Service.

Table 14 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, or other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the

susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 15 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the

embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water

table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 16, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment.

Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

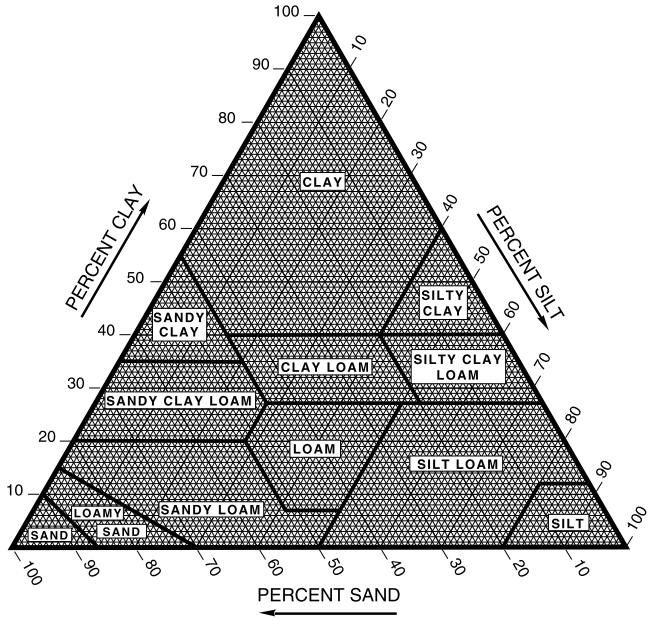

Figure 7.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 18 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Detailed Soil Map Units" in Part I of this survey.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 7). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and

OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 19 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term “permeability” has traditionally been used in soil surveys to indicate saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect retention of water and depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation

systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 19, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factors are shown in table 19 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (as much as 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH

value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Water Features

Table 20 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 20 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 20 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil

profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 21 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

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Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or “chain,” of soils on a

landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clayey soil. Silty clay, sandy clay, or clay. Generally, a soil that has an average clay content of more than 35 percent.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Closed depression. A low area completely surrounded by higher ground and having no natural outlet.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which

classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposits. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large

amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geomorphology. The science that treats the general configuration of the earth's surface; specifically, the study of the classification, description, nature, origin, and development of landforms and their relationships to underlying structures, and the history of geologic changes as recorded by these surface features. The term is especially applied to the genetic interpretation of landforms.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-chroma zones. Zones having chroma of 3 or more. Typical color in areas of iron concentrations.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron concentrations. High-chroma zones having a

high content of iron and manganese oxide because of chemical oxidation and accumulation, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic concentration.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:
Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Kame moraine. An end moraine that contains numerous kames. A group of kames along the front of a stagnant glacier, commonly consisting of the slumped remnants of a formerly continuous outwash plain built up over the foot of rapidly wasting or stagnant ice.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain. A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-chroma zones. Zones having chroma of 2 or less. Typical color in areas of iron depletions.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

MLRA (major land resource area). A geographic area characterized by a particular pattern of land uses, elevation and topography, soils, climate, water resources, and potential natural vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on

features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent

or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil quality. The fitness of a specific kind of soil to function within its surroundings, support plant and animal productivity, maintain or enhance the quality of water and air, and support human health and habitation.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stream channel. The hollow bed where a natural stream or surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor produced during a former stage of erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Understory. Any plants in a forest community that grow to a height of less than 5 feet.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Wheaton, Illinois)

Month	Temperature						Precipitation				
				2 years in 10 will have--		Average		2 years in 10 will have--		Average	
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	number of growing degree days*	Average	Less than--	More than--	number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	29.9	12.4	21.1	56	-20	0	1.61	0.64	2.42	4	11.0
February---	35.2	16.6	25.9	59	-15	0	1.38	.76	2.01	3	8.6
March------	47.7	27.6	37.6	78	2	26	2.65	1.56	3.63	6	4.8
April------	61.6	37.4	49.5	86	16	110	3.78	2.28	5.12	7	1.6
May--------	73.4	47.2	60.3	92	27	328	3.71	2.49	4.83	7	.1
June-------	82.8	56.9	69.9	97	39	590	3.70	2.50	4.80	6	.0
July-------	86.0	61.8	73.9	98	45	734	4.25	2.95	5.44	6	.0
August-----	84.0	60.3	72.1	96	44	677	4.22	1.75	6.31	6	.0
September--	77.3	52.8	65.0	93	33	445	3.72	1.92	5.53	6	.0
October----	64.9	41.7	53.3	86	21	172	2.34	1.02	3.46	4	.2
November---	49.3	31.6	40.5	73	8	30	2.96	1.55	4.19	5	2.1
December---	35.2	18.9	27.1	62	-11	2	2.32	1.09	3.37	5	7.7
Yearly:											
Average---	60.0	38.8	49.7	---	---	---	---	---	---	---	---
Extreme---	---	---	---	99	-21	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,114	36.62	30.94	40.83	65	36.0

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Wheaton, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 20	May 10	May 23
2 years in 10 later than--	Apr. 17	May 5	May 17
5 years in 10 later than--	Apr. 11	Apr. 25	May 4
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 17	Oct. 3	Sept. 26
2 years in 10 earlier than--	Oct. 22	Oct. 9	Sept. 30
5 years in 10 earlier than--	Nov. 1	Oct. 19	Oct. 8

Table 3.--Growing Season

(Recorded in the period 1961-90 at Wheaton, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	186	152	134
8 years in 10	192	161	142
5 years in 10	203	177	158
2 years in 10	215	194	174
1 year in 10	221	202	182

Table 4.--Classification of the Soils

(An asterisk in the first column indicates that some or all of the map units are taxadjuncts. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Ashkum	Fine, mixed, superactive, mesic Typic Endoaquolls
Barrington	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Beecher	Fine, illitic, mesic Udollic Epiaqualfs
Blount	Fine, illitic, mesic Aeric Epiaqualfs
Bowes	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Casco	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Inceptic Hapludalfs
Chenoa	Fine, illitic, mesic Aquic Argiudolls
Del Rey	Fine, illitic, mesic Aeric Epiaqualfs
Drummer	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Dunham	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Elliott	Fine, illitic, mesic Aquic Argiudolls
Faxon	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
Fox	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfs
Graymont	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Grays	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
Grundelein	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Harpster	Fine-silty, mixed, superactive, mesic Typic Calciaquolls
Houghton	Euic, mesic Typic Haplosaprists
Kankakee	Loamy-skeletal, mixed, superactive, mesic Typic Hapludolls
Lorenzo	Fine-loamy over sandy or sandy-skeletal, mixed, active, mesic Typic Argiudolls
Markham	Fine, illitic, mesic Oxyaquic Hapludalfs
Martinton	Fine, illitic, mesic Aquic Argiudolls
Milford	Fine, mixed, superactive, mesic Typic Endoaquolls
Millstream	Fine-silty, mixed, superactive, mesic Aquollic Hapludalfs
Mundelein	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Muskego	Coprogenous, euic, mesic Limnic Haplosaprists
Orthents, clayey	Fine, mixed, nonacid, active, mesic Aquic Udorthents
Orthents, loamy	Fine-loamy, mixed, nonacid, active, mesic Oxyaquic Udorthents
Orthents, stony	Fine-loamy, mixed, calcareous, active, mesic Oxyaquic Udorthents
Ozaukee	Fine, illitic, mesic Oxyaquic Hapludalfs
Peotone	Fine, smectitic, mesic Cumulic Vertic Endoaquolls
Rockton	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Rodman	Sandy-skeletal, mixed, mesic Typic Hapludolls
Romeo	Loamy, mixed, superactive, mesic Lithic Endoaquolls
Rush	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Sawmill	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Selma	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
Swygert	Fine, mixed, superactive, mesic Aquertic Argiudolls
Thorp	Fine-silty, mixed, superactive, mesic Argiaquic Argialbolls
*Varna	Fine, illitic, mesic Oxyaquic Argiudolls
*Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls
Wauconda	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Waupecan	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Zurich	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
23A	Blount silt loam, 0 to 2 percent slopes	790	0.4
23B	Blount silt loam, 2 to 4 percent slopes	449	0.2
67A	Harpster silty clay loam, 0 to 2 percent slopes	221	0.1
69A	Milford silty clay loam, 0 to 2 percent slopes	1,154	0.5
91A	Swygert silty clay loam, 0 to 2 percent slopes	66	*
125A	Selma loam, 0 to 2 percent slopes	37	*
146A	Elliott silt loam, 0 to 2 percent slopes	9,240	4.3
146B	Elliott silt loam, 2 to 4 percent slopes	597	0.3
152A	Drummer silty clay loam, 0 to 2 percent slopes	11,661	5.4
189A	Martinton silt loam, 0 to 2 percent slopes	898	0.4
192A	Del Rey silt loam, 0 to 2 percent slopes	305	0.1
206A	Thorp silt loam, 0 to 2 percent slopes	138	*
223B	Varna silt loam, 2 to 4 percent slopes	7,405	3.4
223C2	Varna silt loam, 4 to 6 percent slopes, eroded	1,429	0.7
232A	Ashkum silty clay loam, 0 to 2 percent slopes	15,517	7.2
290C2	Warsaw silt loam, 4 to 6 percent slopes, eroded	318	0.1
298A	Beecher silt loam, 0 to 2 percent slopes	3,512	1.6
298B	Beecher silt loam, 2 to 4 percent slopes	863	0.4
318C2	Lorenzo loam, 4 to 6 percent slopes, eroded	246	0.1
318D2	Lorenzo loam, 6 to 12 percent slopes, eroded	136	*
323C2	Casco loam, 4 to 6 percent slopes, eroded	156	*
323D2	Casco loam, 6 to 12 percent slopes, eroded	133	*
327B	Fox silt loam, 2 to 4 percent slopes	1,924	0.9
327C2	Fox silt loam, 4 to 6 percent slopes, eroded	457	0.2
330A	Peotone silty clay loam, 0 to 2 percent slopes	3,924	1.8
369B	Waupecan silt loam, 2 to 4 percent slopes	3,205	1.5
442A	Mundelein silt loam, 0 to 2 percent slopes	3,196	1.5
443B	Barrington silt loam, 2 to 4 percent slopes	1,791	0.8
494B	Kankakee fine sandy loam, 2 to 4 percent slopes	253	0.1
503B	Rockton silt loam, 2 to 6 percent slopes	11	*
523A	Dunham silty clay loam, 0 to 2 percent slopes	2,730	1.3
526A	Grundelein silt loam, 0 to 2 percent slopes	1,528	0.7
530B	Ozaukee silt loam, 2 to 4 percent slopes	8,557	4.0
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded	7,586	3.5
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	3,418	1.6
530D3	Ozaukee silty clay loam, 6 to 12 percent slopes, severely eroded	874	0.4
530E	Ozaukee silt loam, 12 to 20 percent slopes	411	0.2
530F	Ozaukee silt loam, 20 to 30 percent slopes	341	0.2
531B	Markham silt loam, 2 to 4 percent slopes	15,142	7.0
531C2	Markham silt loam, 4 to 6 percent slopes, eroded	6,913	3.2
535B	Orthents, stony, undulating	323	0.1
541B	Graymont silt loam, 2 to 5 percent slopes	3,902	1.8
557A	Millstream silt loam, 0 to 2 percent slopes	415	0.2
614A	Chenoa silty clay loam, 0 to 2 percent slopes	4,048	1.9
696B	Zurich silt loam, 2 to 4 percent slopes	779	0.4
696C2	Zurich silt loam, 4 to 6 percent slopes, eroded	88	*
697A	Wauconda silt loam, 0 to 2 percent slopes	1,068	0.5
698B	Grays silt loam, 2 to 4 percent slopes	1,649	0.8
791B	Rush silt loam, 2 to 4 percent slopes	189	*
792B	Bowes silt loam, 2 to 4 percent slopes	517	0.2
802B	Orthents, loamy, undulating	5,744	2.7
802D	Orthents, loamy, rolling	464	0.2
805B	Orthents, clayey, undulating	31,336	14.5
830	Landfills	470	0.2
848B	Drummer-Barrington-Mundelein complex, 1 to 6 percent slopes	1,135	0.5
849A	Milford-Martinton complex, 0 to 2 percent slopes	128	*
854B	Markham-Ashkum-Beecher complex, 1 to 6 percent slopes	30,739	14.3
864	Pits, quarry	70	*
865	Pits, gravel	432	0.2
903A	Muskego and Houghton mucks, 0 to 2 percent slopes	1,246	0.6
969F	Casco-Rodman complex, 20 to 30 percent slopes	10	*

See footnote at end of table.

Table 5.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
1107A	Sawmill silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded	1,060	0.5
1152A	Drummer silty clay loam, undrained, 0 to 2 percent slopes	113	*
1330A	Peotone silty clay loam, undrained, 0 to 2 percent slopes	711	0.3
1516A	Faxon silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded	225	0.1
1523A	Dunham silty clay loam, undrained, 0 to 2 percent slopes	39	*
1903A	Muskego and Houghton mucks, undrained, 0 to 2 percent slopes	1,589	0.7
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	4,875	2.3
3316A	Romeo silt loam, 0 to 2 percent slopes, frequently flooded	21	*
4904A	Muskego and Peotone soils, ponded, 0 to 2 percent slopes	141	*
W	Water	4,397	2.0
	Total	215,455	100.0

* Less than 0.1 percent.

Table 6.--Main Cropland Limitations and Hazards

(Only the soils commonly used as cropland are listed. See text for definitions of terms used in this table.)

Map symbol and soil name	Cropland limitations or hazards
23A:	
Blount	Restricted permeability
	Crusting
	Wetness
23B:	
Blount	Restricted permeability
	Crusting
	Water erosion
	Wetness
67A:	
Harpster	Excessive lime
	Ponding
	Poor tilth
69A:	
Milford	Ponding
	Poor tilth
91A:	
Swygert	Poor tilth
	Restricted permeability
	Wetness
125A:	
Selma	Ponding
146A:	
Elliott	Wetness
146B:	
Elliott	Restricted permeability
	Water erosion
	Wetness
152A:	
Drummer	Ponding
	Poor tilth
189A:	
Martinton	Wetness
192A:	
Del Rey	Restricted permeability
	Crusting
	Wetness
206A:	
Thorp	Ponding
	Restricted permeability
223B:	
Varna	Water erosion
223C2:	
Varna	Water erosion

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
232A:	
Ashkum	Ponding Poor tilth
290C2:	
Warsaw	Excessive permeability Water erosion
298A:	
Beecher	Restricted permeability Wetness
298B:	
Beecher	Restricted permeability Water erosion Wetness
318C2:	
Lorenzo	Excessive permeability Water erosion
318D2:	
Lorenzo	Excessive permeability Water erosion
323C2:	
Casco	Excessive permeability Low available water capacity Water erosion
323D2:	
Casco	Excessive permeability Low available water capacity Water erosion
327B:	
Fox	Excessive permeability Water erosion
327C2:	
Fox	Excessive permeability Water erosion
330A:	
Peotone	Ponding Poor tilth
369B:	
Waupecan	Excessive permeability Water erosion
442A:	
Mundelein	Wetness
443B:	
Barrington	Water erosion
494B:	
Kankakee	Water erosion
503B:	
Rockton	Depth to bedrock Excessive permeability Water erosion

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
523A:	
Dunham	Excessive permeability Ponding Poor tilth
526A:	
Grundelein	Excessive permeability Wetness
530B:	
Ozaukee	Restricted permeability Crusting Water erosion
530C2:	
Ozaukee	Restricted permeability Crusting Water erosion
530D2:	
Ozaukee	Restricted permeability Crusting Water erosion
530D3:	
Ozaukee	Poor tilth Restricted permeability Crusting Water erosion
530E:	
Ozaukee	Restricted permeability Crusting Water erosion
531B:	
Markham	Restricted permeability Water erosion
531C2:	
Markham	Restricted permeability Water erosion
535B:	
Orthents, stony	Stony Crusting Water erosion
541B:	
Graymont	Restricted permeability Water erosion
557A:	
Millstream	Excessive permeability Wetness
614A:	
Chenoa	Restricted permeability Wetness
696B:	
Zurich	Crusting Water erosion

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations or hazards
696C2:	
Zurich	Crusting Water erosion
697A:	
Wauconda	Wetness
698B:	
Grays	Water erosion
791B:	
Rush	Excessive permeability Water erosion
792B:	
Bowes	Excessive permeability Water erosion
802B:	
Orthents, loamy	Crusting Water erosion
802D:	
Orthents, loamy	Crusting Water erosion
805B:	
Orthents, clayey	Low available water capacity Poor tilth Restricted permeability Crusting Water erosion
903A:	
Muskego	Ponding Restricted permeability Subsidence Wind erosion
Houghton	Ponding Subsidence Wind erosion
3107A:	
Sawmill	Flooding Poor tilth Wetness

Table 7.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume
		Bu	Bu	Bu	Bu	Tons	AUM*
23A:							
Blount	2w	106	35	48	64	4.3	7.2
23B:							
Blount	2e	105	35	47	63	4.3	7.1
67A:							
Harpster	2w	136	44	52	74	---	---
69A:							
Milford	2w	131	48	56	81	---	---
91A:							
Swygert	2w	114	39	51	73	4.5	---
125A:							
Selma	2w	136	44	53	76	---	---
146A:							
Elliott	2w	128	45	55	79	5.1	---
146B:							
Elliott	2e	127	45	54	78	5.1	---
152A:							
Drummer	2w	154	51	61	83	---	---
189A:							
Martinton	2w	135	49	57	84	5.3	---
192A:							
Del Rey	2w	115	37	49	69	4.5	7.5
206A:							
Thorp	2w	126	42	51	69	---	---
223B:							
Varna	2e	122	41	52	74	4.8	---
223C2:							
Varna	3e	117	39	50	71	4.6	7.6
232A:							
Ashkum	2w	130	47	54	79	---	---
290C2:							
Warsaw	2e	109	38	50	70	4.4	7.3
298A:							
Beecher	2w	116	39	51	72	4.5	7.5
298B:							
Beecher	2e	115	39	50	71	4.4	7.4

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume
		Bu	Bu	Bu	Bu	Tons	AUM*
318C2:							
Lorenzo	3e	86	28	41	57	3.3	5.6
318D2:							
Lorenzo	3e	84	27	40	56	3.3	5.5
323C2:							
Casco	3e	84	27	38	53	3.2	5.4
323D2:							
Casco	4e	80	26	37	51	3.1	5.3
327B:							
Fox	2e	105	35	42	70	4.3	7.1
327C2:							
Fox	2e	100	33	40	65	4.1	6.8
330A:							
Peotone	2w	123	42	43	58	---	---
369B:							
Waupecan	2e	148	49	61	80	5.2	---
442A:							
Mundelein	1	141	44	57	87	5.5	---
443B:							
Barrington	2e	129	42	54	84	5.3	---
494B:							
Kankakee	2e	111	40	51	69	4.6	---
503B:							
Rockton	2e	108	35	50	76	4.4	---
523A:							
Dunham	2w	144	46	59	81	---	---
526A:							
Grundelein	1	150	46	60	89	5.7	---
530B:							
Ozaukee	2e	105	32	47	75	4.3	7.1
530C2:							
Ozaukee	2e	101	30	45	72	4.1	6.8
530D2:							
Ozaukee	3e	99	30	44	71	4.0	6.7
530D3:							
Ozaukee	4e	91	28	41	65	3.7	6.2
530E:							
Ozaukee	4e	94	28	42	68	3.8	6.4
530F:							
Ozaukee	6e	---	---	---	---	3.3	5.6

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume
		Bu	Bu	Bu	Bu	Tons	AUM*
531B:							
Markham	2e	111	37	49	68	4.4	7.2
531C2:							
Markham	3e	101	33	44	62	4.0	6.6
535B:							
Orthents, stony	2e	80	25	28	48	3.5	6.0
541B:							
Graymont	2e	138	46	59	83	5.5	---
557A:							
Millstream	1	135	42	57	79	5.2	8.7
614A:							
Chenoa	2w	135	45	61	85	5.6	---
696B:							
Zurich	2e	116	37	49	68	4.7	7.7
696C2:							
Zurich	3e	110	35	46	65	4.4	7.3
697A:							
Wauconda	1	129	41	54	80	5.2	8.7
698B:							
Grays	2e	123	40	51	76	4.9	8.2
791B:							
Rush	2e	125	44	50	76	4.8	8.2
792B:							
Bowes	2e	140	46	59	78	5.2	8.7
802B:							
Orthents, loamy	2e	85	27	30	50	3.7	6.2
802D:							
Orthents, loamy	3e	80	25	28	48	3.4	5.7
805B:							
Orthents, clayey	3e	77	24	26	46	3.3	5.6
830:							
Landfills.							
848B		---	---	---	---	---	---
Drummer	2w						
Barrington	2e						
Mundelein	1						
849A	2w	---	---	---	---	---	---
Milford-Martinton							

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume
		Bu	Bu	Bu	Bu	Tons	AUM*
854B		---	---	---	---	---	---
Markham	2e						
Ashkum	2w						
Beecher	2w						
864, 865: Pits.							
903A		110	35	---	75	---	---
Muskego	4w						
Houghton	3w						
969F		---	---	---	---	---	3.8
Casco	7e						
Rodman	7s						
1107A:							
Sawmill	5w	---	---	---	---	---	---
1152A:							
Drummer	5w	---	---	---	---	---	---
1330A:							
Peotone	5w	---	---	---	---	---	---
1516A:							
Faxon	6w	---	---	---	---	---	---
1523A:							
Dunham	5w	---	---	---	---	---	---
1903A		---	---	---	---	---	---
Muskego	6w						
Houghton	5w	---	---	---	---	---	---
3107A:							
Sawmill	3w	132	42	---	---	---	---
3316A:							
Romeo	6s	---	---	---	---	---	---
4904A	8w	---	---	---	---	---	---
Muskego-Peotone							

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 8.--Main Pasture Limitations and Hazards

(Only the soils commonly used for pasture are listed. See text for definitions of terms used in this table.)

Map symbol and soil name	Pasture limitations and hazards
23A:	
Blount	Low pH Wetness
23B:	
Blount	Low pH Water erosion Wetness
192A:	
Del Rey	Low pH Wetness
223C2:	
Varna	Water erosion
290C2:	
Warsaw	Low pH Water erosion
298A:	
Beecher	Low pH Wetness
298B:	
Beecher	Low pH Water erosion Wetness
318C2:	
Lorenzo	Water erosion
318D2:	
Lorenzo	Equipment limitation Water erosion
323C2:	
Casco	Water erosion
323D2:	
Casco	Equipment limitation Water erosion
327B:	
Fox	Low pH Water erosion
327C2:	
Fox	Low pH Water erosion
530B:	
Ozaukee	Water erosion
530C2:	
Ozaukee	Water erosion
530D2:	
Ozaukee	Equipment limitation Water erosion
530D3:	
Ozaukee	Equipment limitation Water erosion

Table 8.--Main Pasture Limitations and Hazards--Continued

Map symbol and soil name	Pasture limitations and hazards
530E:	
Ozaukee	Equipment limitation Water erosion
530F:	
Ozaukee	Equipment limitation Water erosion
531B:	
Markham	Low pH Water erosion
531C2:	
Markham	Low pH Water erosion
535B:	
Orthents, stony	Low fertility Stony Water erosion
557A:	
Millstream	Low pH Wetness
696B:	
Zurich	Low pH Water erosion
696C2:	
Zurich	Low pH Water erosion
697A:	
Wauconda	Wetness
698B:	
Grays	Water erosion
791B:	
Rush	Low pH Water erosion
792B:	
Bowes	Low pH Water erosion
802B:	
Orthents, loamy	Water erosion
802D:	
Orthents, loamy	Equipment limitation Water erosion
805B:	
Orthents, clayey	Low available water capacity Water erosion

Table 8.--Main Pasture Limitations and Hazards--Continued

Map symbol and soil name	Pasture limitations and hazards
969F:	
Casco	Equipment limitation Water erosion
Rodman	Equipment limitation Gravelly Low available water capacity Water erosion

Table 9.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map symbol	Soil name
23A	Blount silt loam, 0 to 2 percent slopes (where drained)
23B	Blount silt loam, 2 to 4 percent slopes
67A	Harpster silty clay loam, 0 to 2 percent slopes (where drained)
69A	Milford silty clay loam, 0 to 2 percent slopes (where drained)
91A	Swygert silty clay loam, 0 to 2 percent slopes
125A	Selma loam, 0 to 2 percent slopes (where drained)
146A	Elliott silt loam, 0 to 2 percent slopes
146B	Elliott silt loam, 2 to 4 percent slopes
152A	Drummer silty clay loam, 0 to 2 percent slopes (where drained)
189A	Martinton silt loam, 0 to 2 percent slopes
192A	Del Rey silt loam, 0 to 2 percent slopes (where drained)
206A	Thorp silt loam, 0 to 2 percent slopes (where drained)
223B	Varna silt loam, 2 to 4 percent slopes
223C2	Varna silt loam, 4 to 6 percent slopes, eroded
232A	Ashkum silty clay loam, 0 to 2 percent slopes (where drained)
290C2	Warsaw silt loam, 4 to 6 percent slopes, eroded
298A	Beecher silt loam, 0 to 2 percent slopes (where drained)
298B	Beecher silt loam, 2 to 4 percent slopes
327B	Fox silt loam, 2 to 4 percent slopes
327C2	Fox silt loam, 4 to 6 percent slopes, eroded
330A	Peotone silty clay loam, 0 to 2 percent slopes (where drained)
369B	Waupecan silt loam, 2 to 4 percent slopes
442A	Mundelein silt loam, 0 to 2 percent slopes
443B	Barrington silt loam, 2 to 4 percent slopes
494B	Kankakee fine sandy loam, 2 to 4 percent slopes
503B	Rockton silt loam, 2 to 6 percent slopes
523A	Dunham silty clay loam, 0 to 2 percent slopes (where drained)
526A	Grundelein silt loam, 0 to 2 percent slopes
530B	Ozaukee silt loam, 2 to 4 percent slopes
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded
531B	Markham silt loam, 2 to 4 percent slopes
531C2	Markham silt loam, 4 to 6 percent slopes, eroded
541B	Graymont silt loam, 2 to 5 percent slopes
557A	Millstream silt loam, 0 to 2 percent slopes
614A	Chenoa silty clay loam, 0 to 2 percent slopes
696B	Zurich silt loam, 2 to 4 percent slopes
696C2	Zurich silt loam, 4 to 6 percent slopes, eroded
697A	Wauconda silt loam, 0 to 2 percent slopes (where drained)
698B	Grays silt loam, 2 to 4 percent slopes
791B	Rush silt loam, 2 to 4 percent slopes
792B	Bowes silt loam, 2 to 4 percent slopes
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)

Table 10.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
23A:					
Blount	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
23B:					
Blount	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
67A:					
Harpster	Coralberry, mapleleaf arrowwood, redosier dogwood.	Blackhaw, cockspur hawthorn, nannyberry, shadbush, silky dogwood.	Eastern redcedar, hackberry, northern red oak, northern whitecedar, tamarack.	Baldcypress, green ash.	---
69A:					
Milford	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
91A:					
Swygert	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
125A:					
Selma	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
146A:					
Elliott	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
146B:					
Elliott	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, nannyberry, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
152A:					
Drummer	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
189A:					
Martinton	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, blackhaw, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
192A:					
Del Rey	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
206A:					
Thorp	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
223B:					
Varna	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
223C2:					
Varna	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
232A:					
Ashkum	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
290C2:					
Warsaw	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
298A:					
Beecher	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
298B:					
Beecher	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
318C2:					
Lorenzo	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
318D2:					
Lorenzo	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
323C2:					
Casco	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
323D2:					
Casco	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
327B:					
Fox	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
327C2:					
Fox	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
330A:					
Peotone	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
369B:					
Waupecan	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
442A:					
Mundelein	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
443B:					
Barrington	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
494B:					
Kankakee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
503B:					
Rockton	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
523A:					
Dunham	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
526A:					
Grundelein	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
530B:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
530C2:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
530D2:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
530D3:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
530E:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
530F:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
531B:					
Markham	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
531C2:					
Markham	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
535B:					
Orthents, stony	Common winterberry, coralberry, gray dogwood, redosier dogwood, roughleaf dogwood, silky dogwood.	Blackhaw, hazelnut, shadbush, witchhazel.	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar.	Norway spruce-------	Eastern white pine.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
541B:					
Graymont	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
557A:					
Millstream	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
614A:					
Chenoa	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, pin oak.
696B:					
Zurich	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
696C2:					
Zurich	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
697A:					
Wauconda	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
698B:					
Grays	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
791B:					
Rush	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
792B:					
Bowes	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
802B:					
Orthents, loamy	Common winterberry, coralberry, gray dogwood, redosier dogwood, roughleaf dogwood, silky dogwood.	Blackhaw, hazelnut, shadbush, witchhazel.	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar.	Norway spruce	Eastern white pine.
802D:					
Orthents, loamy	Common winterberry, coralberry, gray dogwood, redosier dogwood, roughleaf dogwood, silky dogwood.	Blackhaw, hazelnut, shadbush, witchhazel.	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar.	Norway spruce	Eastern white pine.
805B:					
Orthents, clayey	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
830: Landfills.					
848B:					
Drummer	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
Barrington	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
Mundelein	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
849A:					
Milford	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
Martinton	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
854B:					
Markham	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
854B:					
Ashkum	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
Beecher	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
864, 865:					
Pits.					
903A:					
Muskego	Black chokeberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	Common winterberry, nannyberry, rusty blackhaw, shadbush, silky dogwood.	Alternateleaf dogwood, northern whitecedar, tamarack.	Baldcypress, eastern cottonwood.	Imperial Carolina poplar.
Houghton	Black chokeberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	Common winterberry, nannyberry, rusty blackhaw, shadbush, silky dogwood.	Alternateleaf dogwood, northern whitecedar, tamarack.	Baldcypress, eastern cottonwood.	Imperial Carolina poplar.
969F:					
Casco	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
Rodman	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf arrowwood.	Cockspur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush.	Black locust, thornless honeylocust.	---	---

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
1107A:					
Sawmill	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
1152A:					
Drummer	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
1330A:					
Peotone	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
1516A:					
Faxon	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
1523A:					
Dunham	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
1903A:					
Muskego	Black chokeberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	Common winterberry, nannyberry, rusty blackhaw, shadbush, silky dogwood.	Alternateleaf dogwood, northern whitecedar, tamarack.	Baldcypress, eastern cottonwood.	Imperial Carolina poplar.
Houghton	Black chokeberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	Common winterberry, nannyberry, rusty blackhaw, shadbush, silky dogwood.	Alternateleaf dogwood, northern whitecedar, tamarack.	Baldcypress, eastern cottonwood.	Imperial Carolina poplar.

Table 10.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
3107A: Sawmill	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
3316A: Romeo	American plum, black chokeberry, blackhaw, gray dogwood, mapleleaf arrowwood.	Cockspur hawthorn, eastern redcedar, eastern white pine, nannyberry, prairie crabapple, shadbush.	Black locust, thornless honeylocust.	---	---
4904A: Muskego.					
Peotone.					

Table 11.--Forestland Management and Productivity

(Only the soils suitable for production of commercial trees are listed.)

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Suggested trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
23A:										
Blount	3C	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	57	43	Green ash, hickory, eastern redcedar, pin oak, red pine.
							White oak	57	43	
							Sugar maple	54	29	
							White ash	57	43	
23B:										
Blount	3C	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	57	43	Green ash, hickory, eastern redcedar, pin oak, red pine.
							White oak	57	43	
							Sugar maple	54	29	
							White ash	57	43	
192A:										
Del Rey	3C	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	56	43	Green ash, hickory, eastern redcedar, pin oak, red pine.
							Red maple	56	29	
							White ash	56	43	
							White oak	56	43	
							American basswood	56	43	
298A:										
Beecher	4C	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	65	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							Shagbark hickory	---	---	
							Black cherry	---	---	
							White oak	---	---	
							Northern pin oak	---	---	
							Bur oak	---	---	
298B:										
Beecher	4C	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	65	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							Shagbark hickory	---	---	
							Black cherry	---	---	
							White oak	---	---	
							Northern pin oak	---	---	
							Bur oak	---	---	
323C2:										
Casco	3S	Slight	Moderate	Severe	Slight	Moderate	Northern red oak	55	43	Black oak, eastern white pine, eastern redcedar, red pine, black locust.
							Black oak	---	---	
323D2:										
Casco	3S	Moderate	Moderate	Severe	Slight	Moderate	Northern red oak	55	43	Black oak, eastern white pine, eastern redcedar, red pine, black locust.
							Black oak	---	---	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Suggested trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
327B:										
Fox	4A	Slight	Slight	Moderate	Slight	Severe	Northern red oak	65	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							Sugar maple	---	---	
							White ash	---	---	
							Black cherry	---	---	
							White oak	---	---	
327C2:										
Fox	4A	Slight	Slight	Moderate	Slight	Severe	Northern red oak	65	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							Sugar maple	---	---	
							White ash	---	---	
							Black cherry	---	---	
							White oak	---	---	
530B:										
Ozaukee	4D	Slight	Slight	Moderate	Moderate	Severe	Northern red oak	66	57	Northern red oak, white oak, white ash, eastern white pine, tuliptree.
							Sugar maple	---	---	
							White ash	---	---	
							American basswood	---	---	
530C2:										
Ozaukee	4D	Slight	Slight	Moderate	Moderate	Severe	Northern red oak	66	57	Northern red oak, white oak, white ash, eastern white pine, tuliptree.
							Sugar maple	---	---	
							White ash	---	---	
							American basswood	---	---	
530D2:										
Ozaukee	4D	Moderate	Moderate	Moderate	Moderate	Severe	Northern red oak	66	57	Northern red oak, white oak, white ash, eastern white pine, tuliptree.
							Sugar maple	---	---	
							White ash	---	---	
							American basswood	---	---	
530D3:										
Ozaukee	4D	Moderate	Moderate	Moderate	Moderate	Severe	Northern red oak	66	57	Northern red oak, white oak, white ash, eastern white pine, tuliptree.
							Sugar maple	---	---	
							White ash	---	---	
							American basswood	---	---	
530E:										
Ozaukee	4R	Severe	Moderate	Moderate	Moderate	Severe	Northern red oak	66	57	Northern red oak, white oak, white ash, eastern white pine, tuliptree.
							Sugar maple	---	---	
							White ash	---	---	
							American basswood	---	---	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Suggested trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
530F:										
Ozaukee--------	4R	Severe	Severe	Moderate	Moderate	Severe	Northern red oak----	66	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							Sugar maple---------	---	---	
							White ash-----------	---	---	
							American basswood---	---	---	
531B:										
Markham--------	4A	Slight	Slight	Moderate	Moderate	Severe	Northern red oak----	65	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							Shagbark hickory----	---	---	
							Black cherry--------	---	---	
							White oak-----------	---	---	
531C2:										
Markham--------	4A	Slight	Slight	Moderate	Moderate	Severe	Northern red oak----	65	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							Shagbark hickory----	---	---	
							Black cherry--------	---	---	
							White oak-----------	---	---	
557A:										
Millstream-----	4A	Slight	Moderate	Moderate	Slight	Moderate	Northern red oak----	80	60	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							White oak-----------	80	60	
							Tuliptree-----------	90	85	
							Black walnut--------	---	---	
							Shagbark hickory----	---	---	
696B:										
Zurich---------	3A	Slight	Slight	Moderate	Slight	Severe	Sugar maple---------	66	43	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							White ash-----------	---	---	
							White oak-----------	---	---	
							Northern red oak----	---	---	
							American basswood---	---	---	
696C2:										
Zurich---------	3A	Slight	Slight	Moderate	Slight	Severe	Sugar maple---------	66	43	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							White ash-----------	---	---	
							White oak-----------	---	---	
							Northern red oak----	---	---	
							American basswood---	---	---	
697A:										
Wauconda-------	4A	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak----	80	60	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							White oak-----------	80	60	
							Tuliptree-----------	90	85	
							Black walnut--------	---	---	
							Shagbark hickory----	---	---	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Suggested trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
698B:										
Grays	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	80	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							White oak	80	57	
							Tuliptree	90	100	
							Shagbark hickory	---	---	
791B:										
Rush	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	80	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							White oak	80	57	
							Tuliptree	90	100	
							Sweetgum	---	---	
792B:										
Bowes	5A	Slight	Slight	Slight	Slight	Severe	Northern red oak	80	57	Northern red oak, white oak, eastern white pine, white ash, tuliptree.
							White oak	80	57	
							Tuliptree	90	100	
							Shagbark hickory	---	---	
903A:										
Muskego	3W	Slight	Severe	Severe	Severe	Severe	Tamarack	50	43	Green ash, swamp white oak, bur oak, pin oak, common hackberry.
Houghton	2W	Slight	Severe	Severe	Severe	Severe	Silver maple	82	29	Green ash, swamp white oak, bur oak, pin oak, common hackberry.
							Red maple	56	29	
							White ash	56	43	
							Tamarack	52	43	
							Quaking aspen	60	57	
							Northern whitecedar	37	57	
							Green ash	---	---	
969F:										
Casco	3R	Severe	Severe	Severe	Slight	Moderate	Northern red oak	55	43	Black oak, eastern white pine, eastern redcedar, red pine, black locust.
							Black oak	---	---	
Rodman	2R	Severe	Severe	Severe	Slight	Moderate	Northern red oak	45	29	Black oak, eastern white pine, eastern redcedar, red pine, black locust.
							White oak	---	---	
							Red pine	---	---	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Suggested trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
1903A:										
Muskego--------	3W	Slight	Severe	Severe	Severe	Severe	Tamarack----------	50	43	Green ash, swamp white oak, bur oak, pin oak, common hackberry.
Houghton-------	2W	Slight	Severe	Severe	Severe	Severe	Silver maple--------	82	29	Green ash, swamp white oak, bur oak, pin oak, common hackberry.
							Red maple----------	56	29	
							White ash----------	56	43	
							Tamarack----------	52	43	
							Quaking aspen-------	60	57	
							Northern whitecedar-	37	57	
							Green ash----------	---	---	
4904A:										
Muskego--------	3W	Slight	Severe	Severe	Severe	Severe	Tamarack----------	50	43	---
Peotone.										

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of the mean annual increment for fully stocked natural stands.

Table 12.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
23A:					
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
23B:					
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
67A:					
Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
69A:					
Milford	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
91A:					
Swygert	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
125A:					
Selma	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
146A:					
Elliott	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
146B:					
Elliott	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
152A:					
Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
189A:					
Martinton	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
192A:					
Del Rey	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
206A:					
Thorp	Severe: low strength, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
223B:					
Varna	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
223C2:					
Varna	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
232A:					
Ashkum	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
290C2:					
Warsaw	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
298A:					
Beecher	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Severe: wetness.
298B:					
Beecher	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Severe: wetness.
318C2:					
Lorenzo	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
318D2:					
Lorenzo	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
323C2:					
Casco	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty, large stones.
323D2:					
Casco	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, large stones, slope.
327B:					
Fox	Slight	Slight	Moderate: slope.	Slight	Slight.
327C2:					
Fox	Slight	Slight	Moderate: slope.	Slight	Slight.
330A:					
Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
369B:					
Waupecan	Slight	Slight	Moderate: slope.	Slight	Slight.
442A:					
Mundelein	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
443B:					
Barrington	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
494B:					
Kankakee	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones.
503B:					
Rockton	Slight	Slight	Moderate: depth to rock, slope.	Slight	Moderate: depth to rock.
523A:					
Dunham	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
526A:					
Grundelein	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
530B:					
Ozaukee	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
530C2:					
Ozaukee	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
530D2:					
Ozaukee	Moderate: percs slowly, slope, wetness.	Moderate: percs slowly, slope, wetness.	Severe: slope.	Slight	Moderate: slope.
530D3:					
Ozaukee	Moderate: percs slowly, slope, wetness.	Moderate: percs slowly, slope, wetness.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
530E:					
Ozaukee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
530F:					
Ozaukee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
531B:					
Markham	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
531C2:					
Markham	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
535B:					
Orthents, stony	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: large stones, slope, small stones.	Moderate: large stones.	Moderate: large stones.
541B:					
Graymont	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
557A:					
Millstream	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
614A:					
Chenoa	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
696B:					
Zurich	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
696C2:					
Zurich	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
697A:					
Wauconda	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: wetness.
698B:					
Grays	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
791B:					
Rush	Slight	Slight	Moderate: slope.	Slight	Slight.
792B:					
Bowes	Slight	Slight	Moderate: slope.	Slight	Slight.
802B:					
Orthents, loamy	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight	Slight.
802D:					
Orthents, loamy	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Slight	Moderate: slope.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
805B:					
Orthents, clayey	Severe: percs slowly.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.
830:					
Landfills.					
848B:					
Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Barrington	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
Mundelein	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
849A:					
Milford	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Martinton	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
854B:					
Markham	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
Ashkum	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Beecher	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Severe: wetness.
864, 865:					
Pits.					
903A:					
Muskego	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.
Houghton	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.
969F:					
Casco	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rodman	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
1107A:					
Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1152A:					
Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
1330A:					
Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
1516A:					
Faxon	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.
1523A:					
Dunham	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
1903A:					
Muskego	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.
Houghton	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.
3107A:					
Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.
3316A:					
Romeo	Severe: depth to rock, flooding, ponding.	Severe: depth to rock, ponding.	Severe: depth to rock, flooding, ponding.	Severe: ponding.	Severe: depth to rock, flooding, ponding.
4904A:					
Muskego	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.
Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 13.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
23A:										
Blount	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
23B:										
Blount	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
67A:										
Harpster	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
69A:										
Milford	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
91A:										
Swygert	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
125A:										
Selma	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
146A:										
Elliott	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
146B:										
Elliott	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
152A:										
Drummer	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
189A:										
Martinton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
192A:										
Del Rey	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
206A:										
Thorp	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
223B:										
Varna	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
223C2:										
Varna	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
232A:										
Ashkum	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
290C2:										
Warsaw	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
298A:										
Beecher	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
298B:										
Beecher	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
318C2:										
Lorenzo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
318D2:										
Lorenzo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
323C2:										
Casco	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
323D2:										
Casco	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
327B:										
Fox	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
327C2:										
Fox	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
330A:										
Peotone	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
369B:										
Waupecan	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
442A:										
Mundelein	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
443B:										
Barrington	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
494B:										
Kankakee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
503B:										
Rockton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
523A:										
Dunham	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
526A:										
Grundelein	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
530B:										
Ozaukee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
530C2:										
Ozaukee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
530D2:										
Ozaukee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
530D3:										
Ozaukee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
530E:										
Ozaukee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
530F:										
Ozaukee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
531B:										
Markham	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
531C2:										
Markham	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
535B:										
Orthents, stony	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
541B:										
Graymont	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
557A:										
Millstream	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
614A:										
Chenoa	Good	Good	Good	Good	Good	Fair	Fair	Good	Poor	Fair.
696B:										
Zurich	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
696C2:										
Zurich	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
697A:										
Wauconda	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
698B:										
Grays	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
791B:										
Rush	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
792B:										
Bowes	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
802B:										
Orthents, loamy	Good	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
802D:										
Orthents, loamy	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
805B:										
Orthents, clayey--	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
830:										
Landfills.										
848B:										
Drummer----------	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Barrington--------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Mundelein---------	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
849A:										
Milford----------	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Martinton---------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
854B:										
Markham----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ashkum------------	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Beecher----------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
864, 865:										
Pits.										
903A:										
Muskego----------	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Houghton----------	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
969F:										
Casco-------------	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Rodman------------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
1107A:										
Sawmill----------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
1152A:										
Drummer----------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
1330A:										
Peotone----------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
1516A:										
Faxon-------------	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
1523A:										
Dunham------------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
1903A:										
Muskego----------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Houghton----------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
3107A:										
Sawmill	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3316A:										
Romeo	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.
4904A:										
Muskego	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Peotone	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.

Table 14.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
23A:						
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
23B:						
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
67A:						
Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
69A:						
Milford	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
91A:						
Swygert	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness.
125A:						
Selma	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, ponding.	Severe: ponding.
146A:						
Elliott	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
146B:						
Elliott	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
152A:						
Drummer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
189A:						
Martinton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
192A:						
Del Rey	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
206A:						
Thorp	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
223B:						
Varna	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: low strength.	Slight.
223C2:						
Varna	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: low strength.	Slight.
232A:						
Ashkum	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
290C2:						
Warsaw	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
298A:						
Beecher	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
298B:						
Beecher	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
318C2:						
Lorenzo	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
318D2:						
Lorenzo	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
323C2:						
Casco	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty, large stones.
323D2:						
Casco	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, large stones, slope.
327B:						
Fox	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Moderate: frost action, shrink-swell.	Slight.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
327C2:						
Fox	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: frost action, shrink-swell.	Slight.
330A:						
Peotone	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
369B:						
Waupecan	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
442A:						
Mundelein	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
443B:						
Barrington	Severe: cutbanks cave, wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
494B:						
Kankakee	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones, slope.	Moderate: frost action, large stones.	Moderate: large stones.
503B:						
Rockton	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, shrink-swell.	Moderate: depth to rock.
523A:						
Dunham	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
526A:						
Grundelein	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
530B:						
Ozaukee	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: low strength.	Slight.
530C2:						
Ozaukee	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: low strength.	Slight.
530D2:						
Ozaukee	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
530D3:						
Ozaukee	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
530E:						
Ozaukee	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
530F:						
Ozaukee	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
531B:						
Markham	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: low strength.	Slight.
531C2:						
Markham	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: low strength.	Slight.
535B:						
Orthents, stony	Moderate: dense layer, large stones, wetness.	Moderate: large stones.	Moderate: large stones, wetness.	Moderate: large stones.	Moderate: large stones, low strength.	Moderate: large stones.
541B:						
Graymont	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
557A:						
Millstream	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
614A:						
Chenoa	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
696B:						
Zurich	Severe: cutbanks cave, wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
696C2:						
Zurich	Severe: cutbanks cave, wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: frost action, low strength.	Slight.
697A:						
Wauconda	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
698B:						
Grays	Severe: cutbanks cave, wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
791B:						
Rush	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
792B:						
Bowes	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
802B:						
Orthents, loamy	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: low strength.	Slight.
802D:						
Orthents, loamy	Moderate: slope, wetness.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope, wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
805B:						
Orthents, clayey	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: low strength.	Severe: too clayey.
830:						
Landfills.						
848B:						
Drummer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
Barrington	Severe: cutbanks cave, wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
Mundelein	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
849A:						
Milford	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
Martinton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
854B:						
Markham	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: low strength.	Slight.
Ashkum	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
Beecher	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Severe: wetness.
864, 865:						
Pits.						
903A:						
Muskego	Severe: excess humus, ponding.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: frost action, ponding, subsides.	Severe: excess humus, ponding.
Houghton	Severe: excess humus, ponding.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: frost action, ponding, subsides.	Severe: excess humus, ponding.
969F:						
Casco	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rodman	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
1107A:						
Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: flooding, wetness.
1152A:						
Drummer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
1330A:						
Peotone	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
1516A:						
Faxon	Severe: depth to rock, wetness.	Severe: flooding, wetness.	Severe: depth to rock, flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action, wetness.	Severe: flooding, wetness.

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1523A:						
Dunham	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
1903A:						
Muskego	Severe: excess humus, ponding.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: frost action, ponding, subsides.	Severe: excess humus, ponding.
Houghton	Severe: excess humus, ponding.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: frost action, ponding, subsides.	Severe: excess humus, ponding.
3107A:						
Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: flooding, wetness.
3316A:						
Romeo	Severe: depth to rock, ponding.	Severe: depth to rock, flooding, ponding.	Severe: depth to rock, flooding, ponding.	Severe: depth to rock, flooding, ponding.	Severe: depth to rock, flooding, ponding.	Severe: depth to rock, flooding, ponding.
4904A:						
Muskego	Severe: excess humus, ponding.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: frost action, ponding, subsides.	Severe: excess humus, ponding.
Peotone	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.

Table 15.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
23A:					
Blount	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
23B:					
Blount	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
67A:					
Harpster	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: hard to pack, ponding.
69A:					
Milford	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: hard to pack, ponding, too clayey.
91A:					
Swygert	Severe: percs slowly, wetness.	Slight	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
125A:					
Selma	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
146A:					
Elliott	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: too clayey, wetness.
146B:					
Elliott	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
152A:					
Drummer	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
189A:					
Martinton	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, wetness.
192A:					
Del Rey	Severe: percs slowly, wetness.	Slight	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
206A:					
Thorp	Severe: percs slowly, ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
223B:					
Varna	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Poor: hard to pack, too clayey.
223C2:					
Varna	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Poor: hard to pack, too clayey.
232A:					
Ashkum	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
290C2:					
Warsaw	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
298A:					
Beecher	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: too clayey, wetness.
298B:					
Beecher	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: too clayey, wetness.
318C2:					
Lorenzo	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
318D2:					
Lorenzo	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
323C2:					
Casco	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
323D2:					
Casco	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
327B:					
Fox	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
327C2:					
Fox	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
330A:					
Peotone	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: hard to pack, ponding, too clayey.
369B:					
Waupecan	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, too clayey.
442A:					
Mundelein	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
443B:					
Barrington	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
494B:					
Kankakee	Moderate: large stones.	Severe: seepage.	Severe: large stones, seepage.	Severe: seepage.	Poor: large stones.
503B:					
Rockton	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
523A:					
Dunham	Severe: ponding, poor filter.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
526A:					
Grundelein	Severe: poor filter, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
530B:					
Ozaukee	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
530C2:					
Ozaukee	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
530D2:					
Ozaukee	Severe: percs slowly, wetness.	Severe: slope.	Moderate: slope, too clayey, wetness.	Moderate: slope, wetness.	Fair: slope, too clayey, wetness.
530D3:					
Ozaukee	Severe: percs slowly, wetness.	Severe: slope.	Moderate: slope, too clayey, wetness.	Moderate: slope, wetness.	Fair: slope, too clayey, wetness.
530E:					
Ozaukee	Severe: percs slowly, slope, wetness.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
530F:					
Ozaukee	Severe: percs slowly, slope, wetness.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
531B:					
Markham	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
531C2:					
Markham	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
535B:					
Orthents, stony	Severe: percs slowly.	Moderate: slope, wetness.	Severe: wetness.	Moderate: wetness.	Poor: small stones.
541B:					
Graymont	Severe: percs slowly, wetness.	Moderate: seepage, slope.	Moderate: wetness.	Moderate: wetness.	Poor: hard to pack.
557A:					
Millstream	Severe: poor filter, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
614A:					
Chenoa	Severe: percs slowly, wetness.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
696B:					
Zurich	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness.
696C2:					
Zurich	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
697A:					
Wauconda	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
698B:					
Grays	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
791B:					
Rush	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer, too clayey.
792B:					
Bowes	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer, too clayey.
802B:					
Orthents, loamy	Severe: percs slowly, wetness.	Moderate: slope, wetness.	Moderate: too clayey, wetness.	Slight	Fair: too clayey.
802D:					
Orthents, loamy	Severe: percs slowly, wetness.	Severe: slope.	Moderate: slope, too clayey, wetness.	Moderate: slope.	Fair: slope, too clayey.
805B:					
Orthents, clayey	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: hard to pack, too clayey.
830:					
Landfills.					
848B:					
Drummer	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
Barrington	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
Mundelein	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
849A:					
Milford	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: hard to pack, ponding, too clayey.
Martinton	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, wetness.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
854B:					
Markham	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Ashkum	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: ponding.
Beecher	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: too clayey, wetness.
864, 865: Pits.					
903A:					
Muskego	Severe: percs slowly, ponding, subsides.	Severe: excess humus, ponding, seepage.	Severe: excess humus, ponding.	Severe: ponding, seepage.	Poor: hard to pack, ponding.
Houghton	Severe: percs slowly, ponding, subsides.	Severe: excess humus, ponding, seepage.	Severe: excess humus, ponding, seepage.	Severe: ponding, seepage.	Poor: excess humus, ponding.
969F:					
Casco	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, small stones, too sandy.
Rodman	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, small stones, too sandy.
1107A:					
Sawmill	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
1152A:					
Drummer	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
1330A:					
Peotone	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: hard to pack, ponding, too clayey.
1516A:					
Faxon	Severe: depth to rock, flooding, wetness.	Severe: depth to rock, flooding, wetness.	Severe: depth to rock, flooding, wetness.	Severe: depth to rock, flooding, wetness.	Poor: depth to rock, wetness.

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1523A:					
Dunham	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
1903A:					
Muskego	Severe: percs slowly, ponding, subsides.	Severe: excess humus, ponding, seepage.	Severe: excess humus, ponding.	Severe: ponding, seepage.	Poor: hard to pack, ponding.
Houghton	Severe: percs slowly, ponding, subsides.	Severe: excess humus, ponding, seepage.	Severe: excess humus, ponding, seepage.	Severe: ponding, seepage.	Poor: excess humus, ponding.
3107A:					
Sawmill	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3316A:					
Romeo	Severe: depth to rock, flooding, ponding.	Severe: depth to rock, flooding, ponding.	Severe: depth to rock, flooding, ponding.	Severe: depth to rock, flooding, ponding.	Poor: depth to rock, ponding.
4904A:					
Muskego	Severe: percs slowly, ponding, subsides.	Severe: excess humus, ponding, seepage.	Severe: excess humus, ponding.	Severe: ponding, seepage.	Poor: hard to pack, ponding.
Peotone	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: hard to pack, ponding, too clayey.

Table 16.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
23A:				
Blount	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
23B:				
Blount	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
67A:				
Harpster	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
69A:				
Milford	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
91A:				
Swygert	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
125A:				
Selma	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
146A:				
Elliott	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
146B:				
Elliott	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
152A:				
Drummer	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
189A:				
Martinton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
192A:				
Del Rey	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
206A:				
Thorp	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
223B:				
Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
223C2: Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
232A: Ashkum	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
290C2: Warsaw	Good	Probable	Probable	Poor: area reclaim, small stones.
298A: Beecher	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
298B: Beecher	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
318C2: Lorenzo	Good	Probable	Probable	Poor: area reclaim, small stones, too sandy.
318D2: Lorenzo	Good	Probable	Probable	Poor: area reclaim, small stones, too sandy.
323C2: Casco	Good	Probable	Probable	Poor: area reclaim, small stones, too sandy.
323D2: Casco	Good	Probable	Probable	Poor: area reclaim, small stones, too sandy.
327B: Fox	Good	Probable	Probable	Poor: area reclaim, small stones.
327C2: Fox	Good	Probable	Probable	Poor: area reclaim, small stones.
330A: Peotone	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
369B:				
Waupecan	Fair: shrink-swell.	Probable	Probable	Poor: area reclaim.
442A:				
Mundelein	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
443B:				
Barrington	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
494B:				
Kankakee	Fair: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, large stones.
503B:				
Rockton	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones.
523A:				
Dunham	Poor: wetness.	Probable	Probable	Poor: area reclaim, wetness.
526A:				
Grundelein	Fair: wetness.	Probable	Probable	Poor: area reclaim.
530B:				
Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
530C2:				
Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
530D2:				
Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
530D3:				
Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
530E:				
Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
530F:				
Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
531B:				
Markham	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
531C2:				
Markham	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
535B:				
Orthents, stony	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
541B:				
Graymont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
557A:				
Millstream	Fair: wetness.	Probable	Probable	Poor: area reclaim.
614A:				
Chenoa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
696B:				
Zurich	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
696C2:				
Zurich	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
697A:				
Wauconda	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
698B:				
Grays	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
791B:				
Rush	Fair: shrink-swell.	Probable	Probable	Poor: area reclaim.
792B:				
Bowes	Fair: shrink-swell.	Probable	Probable	Poor: area reclaim.
802B:				
Orthents, loamy	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
802D:				
Orthents, loamy	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones, too clayey.
805B:				
Orthents, clayey	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
830: Landfills.				
848B:				
Drummer	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Barrington	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
Mundelein	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
849A:				
Milford	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Martinton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
854B:				
Markham	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ashkum	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Beecher	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
864, 865: Pits.				
903A:				
Muskego	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Houghton	Poor: low strength, wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
969F:				
Casco	Moderate: slope.	Probable	Probable	Poor: area reclaim, small stones, too sandy.
Rodman	Moderate: slope.	Probable	Probable	Poor: area reclaim, small stones, too sandy.
1107A:				
Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1152A:				
Drummer	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1330A:				
Peotone	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
1516A:				
Faxon	Poor: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
1523A:				
Dunham	Poor: wetness.	Probable	Probable	Poor: area reclaim, wetness.
1903A:				
Muskego	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Houghton	Poor: low strength, wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
3107A:				
Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3316A:				
Romeo	Poor: depth to rock, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, wetness.
4904A:				
Muskego	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Peotone	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 17.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
23A: Blount	Slight	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
23B: Blount	Moderate: slope.	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
67A: Harpster	Severe: seepage.	Severe: ponding.	Moderate: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
69A: Milford	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
91A: Swygert	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly	Percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.
125A: Selma	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Ponding	Wetness.
146A: Elliott	Slight	Moderate: hard to pack, piping, wetness.	Severe: no water.	Favorable	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, wetness.
146B: Elliott	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
152A: Drummer	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
189A: Martinton	Slight	Severe: wetness.	Severe: slow refill.	Favorable	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
192A: Del Rey	Slight	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, wetness.
206A: Thorp	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave, slow refill.	Frost action, percs slowly, ponding.	Percs slowly, ponding.	Erodes easily, percs slowly, ponding.	Erodes easily, percs slowly, wetness.
223B: Varna	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Favorable	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth.
223C2: Varna	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.
232A: Ashkum	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
290C2: Warsaw	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope	Too sandy	Favorable.
298A: Beecher	Slight	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
298B: Beecher	Moderate: slope.	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
318C2: Lorenzo	Severe: seepage.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Too sandy	Droughty.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
318D2:							
Lorenzo	Severe: seepage, slope.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Slope, too sandy.	Droughty, slope.
323C2:							
Casco	Severe: seepage.	Severe: piping, seepage, thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Large stones, too sandy.	Droughty, large stones.
323D2:							
Casco	Severe: seepage, slope.	Severe: piping, seepage, thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Large stones, slope, too sandy.	Droughty, large stones, slope.
327B:							
Fox	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Favorable	Too sandy	Favorable.
327C2:							
Fox	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Slope	Too sandy	Favorable.
330A:							
Peotone	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
369B:							
Waupecan	Severe: seepage.	Moderate: thin layer.	Severe: no water.	Deep to water	Favorable	Erodes easily	Erodes easily.
442A:							
Mundelein	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
443B:							
Barrington	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
494B:							
Kankakee	Severe: seepage.	Severe: large stones, seepage.	Severe: no water.	Deep to water	Large stones	Large stones	Large stones.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
503B:							
Rockton	Moderate: depth to rock, seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
523A:							
Dunham	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
526A:							
Grundelein	Severe: seepage.	Severe: wetness.	Severe: cutbanks cave.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
530B:							
Ozaukee	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly	Percs slowly, wetness.	Erodes easily, percs slowly.	Erodes easily, percs slowly, rooting depth.
530C2:							
Ozaukee	Moderate: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.
530D2:							
Ozaukee	Severe: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, rooting depth, slope.
530D3:							
Ozaukee	Severe: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, rooting depth, slope.
530E:							
Ozaukee	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, rooting depth, slope.
530F:							
Ozaukee	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, rooting depth, slope.
531B:							
Markham	Moderate: slope.	Moderate: wetness.	Severe: no water.	Percs slowly	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
531C2:							
Markham	Moderate: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.
535B:							
Orthents, stony	Moderate: seepage, slope.	Severe: piping.	Severe: slow refill.	Deep to water	Erodes easily, slope.	Erodes easily, large stones.	Erodes easily, large stones, rooting depth.
541B:							
Graymont	Moderate: seepage, slope.	Moderate: hard to pack, piping, wetness.	Severe: no water.	Frost action, percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly.
557A:							
Millstream	Severe: seepage.	Severe: wetness.	Severe: cutbanks cave.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
614A:							
Chenoa	Moderate: seepage.	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, wetness.
696B:							
Zurich	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily.
696C2:							
Zurich	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Frost action, slope.	Erodes easily, slope, wetness.	Erodes easily, wetness.	Erodes easily.
697A:							
Wauconda	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
698B:							
Grays	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily.
791B:							
Rush	Severe: seepage.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
792B:							
Bowes	Severe: seepage.	Moderate: thin layer.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
802B:							
Orthents, loamy	Moderate: slope.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily, rooting depth.
802D:							
Orthents, loamy	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, rooting depth, slope.
805B:							
Orthents, clayey	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Slope, slow intake, wetness.	Erodes easily, percs slowly, wetness.	Droughty, erodes easily, rooting depth.
830:							
Landfills.							
848B:							
Drummer	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
Barrington	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily.
Mundelein	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
849A:							
Milford	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
Martinton	Slight	Severe: wetness.	Severe: slow refill.	Favorable	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
854B:							
Markham	Moderate: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.
Ashkum	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
854B:							
Beecher	Moderate: slope.	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
864, 865:							
Pits.							
903A:							
Muskego	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Percs slowly, ponding, subsides.	Percs slowly, ponding, soil blowing.	Percs slowly, ponding, soil blowing.	Percs slowly, wetness.
Houghton	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
969F:							
Casco	Severe: seepage, slope.	Severe: piping, seepage, thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Large stones, slope, too sandy.	Droughty, large stones, slope.
Rodman	Severe: seepage, slope.	Severe: seepage, thin layer.	Severe: no water.	Deep to water	Droughty, slope.	Slope, too sandy.	Droughty, slope.
1107A:							
Sawmill	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
1152A:							
Drummer	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
1330A:							
Peotone	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
1516A:							
Faxon	Moderate: depth to rock, seepage.	Severe: piping, wetness.	Severe: depth to rock.	Depth to rock, flooding, frost action.	Depth to rock, flooding, wetness.	Depth to rock, wetness.	Depth to rock, wetness.
1523A:							
Dunham	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, rooting depth, wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1903A:							
Muskego	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Percs slowly, ponding, subsides.	Percs slowly, ponding, soil blowing.	Percs slowly, ponding, soil blowing.	Percs slowly, wetness.
Houghton	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
3107A:							
Sawmill	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
3316A:							
Romeo	Severe: depth to rock.	Severe: ponding, thin layer.	Severe: depth to rock, no water.	Depth to rock, flooding, ponding.	Depth to rock, ponding.	Depth to rock, ponding.	Depth to rock, wetness.
4904A:							
Muskego	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, percs slowly.	Percs slowly, ponding, soil blowing.	Percs slowly, ponding, soil blowing.	Percs slowly, wetness.
Peotone	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.

Table 18.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
23A:												
Blount	0-7	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	7-13	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	20-35	8-18
	13-26	Silty clay loam, silty clay, clay loam.	CH, CL	A-6, A-7	0-1	0-5	95-100	85-98	70-97	65-95	35-60	15-35
	26-32	Silty clay loam, clay loam, silty clay.	CH, ML, CL	A-6, A-7	0-1	0-5	95-100	80-95	65-93	60-90	35-55	10-30
	32-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	90-100	80-93	65-92	60-90	30-50	10-25
23B:												
Blount	0-6	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	6-10	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	20-35	8-18
	10-23	Silty clay loam, silty clay, clay loam.	CH, CL	A-6, A-7	0-1	0-5	95-100	85-98	70-97	65-95	35-60	15-35
	23-34	Silty clay loam, clay loam, silty clay.	CH, CL, ML	A-6, A-7	0-1	0-5	95-100	80-95	65-93	60-90	35-55	10-30
	34-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	90-100	80-93	65-92	60-90	30-50	10-25
67A:												
Harpster	0-18	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	85-100	45-60	20-35
	18-36	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	85-100	40-60	20-35
	36-41	Silty clay loam, silt loam, loam.	CH, CL	A-6, A-7	0	0	100	95-100	95-100	65-100	35-55	20-35
	41-60	Stratified sandy loam to clay loam.	CL, SC-SM, CL-ML, SC	A-6, A-4, A-7	0	0	100	90-100	95-100	45-95	20-50	5-25
69A:												
Milford	0-18	Silty clay loam	CH, CL	A-7	0	0	100	95-100	90-100	75-95	40-55	20-30
	18-50	Silty clay, silty clay loam, clay loam.	CH, CL	A-7	0	0	100	95-100	90-100	75-100	40-60	20-40
	50-60	Stratified clay to sandy loam.	CL, SC	A-6, A-7	0	0	95-100	95-100	90-100	45-100	25-50	10-30
91A:												
Swygert	0-12	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-50	15-25
	12-18	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-55	15-30
	18-51	Silty clay, clay	CH	A-7	0	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	51-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	0-5	95-100	95-100	90-100	75-95	40-65	20-40
125A:												
Selma	0-16	Loam	CL	A-4, A-6	0	0	100	95-100	80-100	55-85	25-35	7-17
	16-45	Sandy loam, loam, silty clay loam.	CL, SC	A-6	0	0	100	85-100	80-95	38-85	24-36	11-19
	45-60	Stratified sand to silt loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0	0	90-100	80-100	60-90	10-70	15-35	5-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
146A:												
Elliott	0-6	Silt loam	CL	A-4, A-6	0	0	95-100	95-100	90-100	80-100	30-40	8-18
	6-11	Silty clay loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-100	80-100	30-50	11-20
	11-41	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	70-96	30-52	11-26
	41-60	Silty clay loam, clay loam.	CL	A-6, A-7	0	0-5	90-100	80-100	75-100	65-95	28-45	11-24
146B:												
Elliott	0-9	Silt loam	CL	A-4, A-6	0	0	95-100	95-100	90-100	80-100	30-40	8-18
	9-13	Silty clay loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-100	80-100	30-50	11-20
	13-35	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	70-96	30-52	11-26
	35-60	Silty clay loam, clay loam.	CL	A-6, A-7	0	0-5	90-100	80-100	75-100	65-95	28-45	11-24
152A:												
Drummer	0-14	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	14-42	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	42-50	Silt loam, clay loam, sandy loam.	CL, SC	A-6, A-7	0	0-5	95-100	93-100	75-95	40-85	30-50	15-30
	50-60	Stratified loamy sand to silty clay loam.	CL, SC	A-2-4, A-4, A-6	0	0-5	95-100	80-98	75-95	15-85	20-35	7-20
189A:												
Martinton	0-17	Silt loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	75-95	30-45	10-20
	17-42	Silty clay loam, silty clay.	CL	A-6, A-7	0	0	95-100	95-100	90-100	70-95	35-50	20-30
	42-60	Stratified sandy loam to silty clay.	CL, SC	A-6, A-7	0	0	90-100	80-100	75-100	35-90	25-45	10-25
192A:												
Del Rey	0-4	Silt loam	CL	A-6	0	0	95-100	95-100	90-100	70-95	25-45	10-25
	4-9	Silt loam	CL	A-6	0	0	95-100	95-100	90-100	70-95	20-40	8-20
	9-41	Silty clay loam, silty clay.	CH, CL	A-7	0	0	95-100	95-100	90-100	85-95	40-55	20-30
	41-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	95-100	95-100	90-100	70-95	30-45	10-25
206A:												
Thorp	0-11	Silt loam	CL	A-4, A-6	0	0	98-100	95-100	90-100	85-100	20-40	8-19
	11-15	Silt loam	CL	A-4, A-6	0	0	98-100	95-100	90-100	85-100	25-35	7-15
	15-41	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	98-100	95-100	90-100	85-100	35-50	13-27
	41-49	Silt loam, clay loam, sandy clay loam.	CL, SC	A-4, A-7, A-6	0	0	95-100	85-100	75-95	40-90	20-50	8-26
	49-60	Stratified loamy sand to silty clay loam.	CL-ML, ML, SM, SC-SM	A-2, A-4	0	0	90-100	80-100	65-85	20-80	5-25	NP-15
223B:												
Varna	0-12	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	12-48	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	75-95	35-56	15-29
	48-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	70-95	30-45	13-26

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
223C2:												
Varna	0-9	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	9-40	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	75-95	35-56	15-29
	40-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	70-95	30-45	13-26
232A:												
Ashkum	0-12	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	75-100	40-55	20-30
	12-29	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	90-100	85-100	75-100	45-65	20-35
	29-60	Silty clay loam	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	75-95	35-50	15-30
290C2:												
Warsaw	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	85-100	85-100	70-100	50-90	20-30	4-12
	8-25	Sandy clay loam, loam, clay loam.	CL, CL-ML, SC-SM, SC	A-2-6, A-2-4, A-4, A-6	0	0-3	90-100	85-100	60-90	30-70	20-35	6-15
	25-29	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy loam.	GC, CL, SC, SC-SM	A-2-6, A-2-4, A-4, A-6	0	0-5	70-90	65-85	55-70	30-60	20-35	6-15
	29-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, GP-GM, SP-SM, SP	A-1	0	1-5	30-85	15-80	7-20	2-10	0-20	NP
298A:												
Beecher	0-9	Silt loam	ML	A-6, A-4, A-7	0	0	95-100	95-100	90-100	85-95	30-45	7-15
	9-37	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	80-95	35-55	15-30
	37-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	85-100	80-95	75-90	28-50	10-25
298B:												
Beecher	0-7	Silt loam	ML	A-4, A-6, A-7	0	0	95-100	95-100	90-100	85-95	30-45	7-15
	7-36	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	80-95	35-55	15-30
	36-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	85-100	80-95	75-90	28-50	10-25
318C2:												
Lorenzo	0-7	Loam	CL	A-6	---	0-5	95-100	90-100	85-100	60-95	25-40	10-20
	7-16	Loam, clay loam, gravelly sandy clay loam.	CL, SC	A-2-6, A-6, A-7	---	5-10	85-100	50-97	35-85	20-60	30-50	10-25
	16-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP-GM, SP, GP, SP-SM	A-1, A-2	---	5-20	25-80	10-70	5-40	0-10	0-30	NP-10

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
318D2:												
Lorenzo---	0-7	Loam---	CL	A-6	---	0-5	95-100	90-100	85-100	60-95	25-40	10-20
	7-16	Loam, clay loam, gravelly sandy clay loam.	CL, SC	A-2-6, A-7, A-6	---	5-10	85-100	50-97	35-85	20-60	30-50	10-25
	16-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GP, SP-SM, GP-GM, SP	A-1, A-2	---	5-20	25-80	10-70	5-40	0-10	0-30	NP-10
323C2:												
Casco---	0-8	Loam---	CL, CL-ML, ML	A-4	0	0-9	90-100	85-100	65-95	50-80	20-30	3-10
	8-18	Clay loam, sandy clay loam, gravelly loam.	CL, SC, GC	A-6, A-2, A-7	0-1	0-9	55-100	50-100	40-90	20-80	25-46	11-26
	18-60	Stratified sand to extremely gravelly coarse sand.	GP-GM, GP, SP, SP-SM	A-1, A-2, A-3	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP
323D2:												
Casco---	0-8	Loam---	CL, CL-ML, ML	A-4	0	0-9	90-100	85-100	65-95	50-80	20-30	3-10
	8-18	Clay loam, sandy clay loam, gravelly loam.	CL, GC, SC	A-2, A-6, A-7	0-1	0-9	55-100	50-100	40-90	20-80	25-46	11-26
	18-60	Stratified sand to extremely gravelly coarse sand.	GP-GM, SP, GP, SP-SM	A-1, A-3, A-2	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP
327B:												
Fox---	0-7	Silt loam---	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-95	65-90	0-25	3-8
	7-32	Clay loam, sandy clay loam, very gravelly loam.	CL, SC, GC	A-2, A-7, A-6	0-1	0-5	65-100	40-100	30-95	15-80	22-45	10-25
	32-60	Stratified gravelly sand to extremely gravelly coarse sand.	GP, SP-SM, GP-GM, SP	A-2, A-1, A-3	0-3	0-10	30-100	15-85	10-70	2-10	0-14	NP
327C2:												
Fox---	0-7	Silt loam---	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-95	65-90	0-25	3-8
	7-32	Clay loam, sandy clay loam, very gravelly loam.	CL, SC, GC	A-2, A-7, A-6	0-1	0-5	65-100	40-100	30-95	15-80	22-45	10-25
	32-60	Stratified gravelly sand to extremely gravelly coarse sand.	GP-GM, SP, GP, SP-SM	A-2, A-1, A-3	0-3	0-10	30-100	15-85	10-70	2-10	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
330A:												
Peotone	0-13	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	90-100	40-65	15-35
	13-50	Silty clay loam, silty clay.	CH, CL	A-7	0	0-5	100	95-100	90-100	85-100	40-70	15-40
	50-60	Silty clay loam, silt loam, silty clay.	CH, CL	A-6, A-7	0	0-5	95-100	95-100	90-100	75-100	30-60	15-30
369B:												
Waupecan	0-11	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	85-95	20-35	8-15
	11-39	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-45	15-25
	39-45	Stratified loam to gravelly loamy sand.	CL, SM, ML, SC	A-2, A-4	0	0	90-100	50-100	50-70	25-65	0-20	NP-10
	45-60	Stratified gravelly loamy sand to extremely gravelly coarse sand.	GM, GW, SP, SP-SM	A-1	0-5	5-35	40-95	15-80	30-50	0-15	0-14	NP
442A:												
Mundelein	0-17	Silt loam	CL	A-6, A-4, A-7	0	0	98-100	95-100	95-100	85-95	25-45	5-20
	17-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	95-100	95-100	95-100	75-95	35-50	15-25
	31-42	Sandy loam, silt loam, clay loam.	CL, SC-SM	A-4, A-6, A-7	0	0	95-100	85-100	80-95	60-90	20-45	8-20
	42-60	Stratified silt loam to fine sand.	ML, CL, SC, SM	A-4, A-2, A-6	0	0	90-100	80-100	60-90	20-75	0-35	NP-20
443B:												
Barrington	0-11	Silt loam	CL	A-4, A-6	0	0	100	95-100	90-100	80-95	30-40	8-18
	11-32	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	95-100	80-95	35-50	11-25
	32-42	Fine sandy loam, silt loam, clay loam.	CL, SC-SM	A-4, A-6, A-7	0	0	95-100	85-100	80-100	60-90	20-45	8-20
	42-60	Stratified fine sandy loam to very fine sand.	CL-ML, CL, SC, SC-SM	A-2, A-6, A-4	0	0	95-100	80-100	70-100	30-70	15-30	5-15
494B:												
Kankakee	0-14	Fine sandy loam	CL	A-6, A-7	0	0-10	95-100	95-100	80-90	50-55	30-45	10-20
	14-22	Sandy loam, clay loam, sandy clay.	CL, SC	A-6, A-7	0-1	0-10	95-100	85-98	70-90	40-60	30-50	10-25
	22-60	Very cobbly loam, extremely cobbly sandy loam.	SC, SC-SM, SP-SC, SM	A-1, A-2	0-2	30-80	70-90	35-80	25-60	10-35	20-40	NP-15
503B:												
Rockton	0-11	Silt loam	CL, CL-ML, ML	A-4	0	0	90-100	90-100	85-95	50-75	25-35	5-10
	11-35	Loam, sandy clay loam, clay loam.	CL, SC	A-6, A-7	0	0	90-100	90-100	75-90	45-70	30-45	10-20
	35-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
523A:												
Dunham----------	0-11	Silty clay loam--	CL	A-6, A-7	0	0	100	100	95-100	85-95	30-50	15-30
	11-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	98-100	90-100	85-95	35-45	15-25
	31-42	Clay loam, silt loam, gravelly sandy loam.	CL, SC	A-2, A-6, A-4	0	0-5	90-100	70-100	55-90	30-80	25-40	8-20
	42-60	Gravelly sand, extremely gravelly coarse sand.	GP-GM, GM, SM, SP-SM	A-1	0-3	0-10	35-90	15-80	10-40	2-25	0-14	NP
526A:												
Grundelein------	0-13	Silt loam--------	CL	A-4, A-6	0	0	100	100	90-100	85-100	30-40	8-15
	13-29	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	98-100	90-100	80-100	35-50	10-25
	29-43	Stratified gravelly sandy loam to silty clay loam.	CL, SC	A-2-4, A-4, A-6	0	0-5	90-100	70-100	55-90	30-80	25-40	8-20
	43-60	Gravelly sand, extremely gravelly coarse sand, gravelly sandy loam.	GM, GP-GM, SP-SM, SM	A-1	0-3	0-10	40-90	15-80	10-50	2-25	0-14	NP
530B:												
Ozaukee---------	0-4	Silt loam--------	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-10	Silt loam--------	CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	10-39	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	39-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	80-95	70-90	35-45	15-25
530C2:												
Ozaukee---------	0-6	Silt loam--------	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-28	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	28-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
530D2:												
Ozaukee---------	0-6	Silt loam--------	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-28	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	28-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
530D3:												
Ozaukee---------	0-7	Silty clay loam--	CL	A-6, A-7	0	0-1	90-98	85-98	85-95	80-95	35-50	15-25
	7-25	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	25-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
530E:												
Ozaukee	0-4	Silt loam	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-10	Silt loam	CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	10-39	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	39-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
530F:												
Ozaukee	0-4	Silt loam	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-10	Silt loam	CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	10-39	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	39-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
531B:												
Markham	0-8	Silt loam	CL, CL-ML	A-4, A-6	0-1	0-5	95-100	95-100	90-100	85-95	23-40	6-17
	8-32	Silty clay, silty clay loam.	CH, CL	A-7	0-2	0-10	95-100	90-100	85-100	80-90	40-54	15-28
	32-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-2	0-10	95-100	85-100	80-95	75-90	30-45	13-26
531C2:												
Markham	0-8	Silt loam	CL, CL-ML	A-4, A-6	0-1	0-5	95-100	95-100	90-100	85-95	23-40	6-17
	8-29	Silty clay, silty clay loam.	CH, CL	A-7	0-2	0-10	95-100	90-100	85-100	80-90	40-54	15-28
	29-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-2	0-10	95-100	85-100	80-95	75-90	30-45	13-26
535B:												
Orthents, stony	0-6	Stony loam	CL, CL-ML	A-4, A-6	15-30	5-15	90-95	75-85	60-70	50-60	20-40	5-20
	6-60	Stony loam, stony sandy clay loam, stony clay loam.	CL, CL-ML	A-4, A-6	15-30	5-25	85-95	70-85	60-70	50-60	20-40	5-20
541B:												
Graymont	0-12	Silt loam	CL-ML, ML	A-4, A-6, A-7-6	0	0	100	100	95-100	90-100	28-47	6-17
	12-33	Silty clay loam, silty clay, silt loam.	MH, ML	A-4, A-7, A-6	0	0	100	100	95-100	90-100	33-58	8-27
	33-38	Silty clay loam, silt loam.	CH, CL	A-4, A-7, A-6	0	0-5	90-100	85-99	80-95	70-95	30-53	9-27
	38-60	Silty clay loam, silt loam.	CH, CL	A-6, A-4, A-7	0	0-5	90-100	80-98	75-95	70-95	25-53	9-27
557A:												
Millstream	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	85-100	30-40	8-15
	8-13	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	85-100	25-35	5-15
	13-30	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	98-100	90-100	80-100	35-50	10-25
	30-46	Stratified gravelly loamy sand to silty clay loam.	CL, SC	A-4, A-2-4, A-6	0	0-5	90-100	70-100	50-90	30-80	25-40	8-20
	46-65	Gravelly loamy sand, extremely gravelly coarse sand.	GP-GM, SM, GM, SP-SM	A-1	0-3	0-10	40-90	15-80	10-50	2-25	0-14	NP

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
614A:												
Chenoa----------	0-12	Silty clay loam--	CL, ML	A-6, A-4, A-7	0	0	100	100	95-100	90-100	32-48	8-21
	12-32	Silty clay loam, silty clay.	MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	33-58	8-27
	32-36	Silty clay loam, silt loam.	CH, CL	A-4, A-7, A-6	0	0-5	90-100	85-99	80-95	70-95	30-53	9-27
	36-60	Silty clay loam, silt loam.	CH, CL	A-4, A-7, A-6	0	0-5	90-100	80-98	75-95	70-95	30-53	9-27
696B:												
Zurich----------	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	80-95	25-40	5-20
	5-9	Silt loam--------	CL	A-4, A-6	0	0	100	95-100	90-100	80-95	20-35	5-15
	9-28	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	90-100	75-95	30-45	10-25
	28-38	Fine sandy loam, silt loam, loam.	CL, SC-SM	A-4, A-6	0	0	95-100	85-100	80-100	40-90	20-40	8-20
	38-60	Stratified very fine sand to silt loam.	CL, ML, SM, SC	A-2, A-6, A-4	0	0	90-100	80-100	70-100	30-85	15-30	NP-20
696C2:												
Zurich----------	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	80-95	25-40	5-20
	8-28	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	90-100	75-95	30-45	10-25
	28-34	Fine sandy loam, silt loam, loam.	CL, SC-SM	A-4, A-6	0	0	95-100	85-100	80-100	40-90	20-40	8-20
	34-60	Stratified very fine sand to silt loam.	ML, SC, CL, SM	A-2, A-4, A-6	0	0	90-100	80-100	70-100	30-85	15-30	NP-20
697A:												
Wauconda---------	0-9	Silt loam--------	CL	A-4, A-6	0	0	100	100	95-100	80-100	25-40	8-20
	9-14	Silt loam--------	CL	A-4, A-6	0	0	100	100	95-100	80-95	20-35	5-15
	14-30	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	90-100	85-100	30-45	15-30
	30-38	Silt loam, loam, sandy loam.	CL, SC-SM	A-4, A-6	0	0	95-100	85-100	80-95	40-90	20-35	8-20
	38-60	Loam, silt loam, sand.	ML, CL, SC, SM	A-4, A-2, A-6	0	0	95-100	80-100	70-95	30-85	0-30	NP-15
698B:												
Grays-----------	0-8	Silt loam--------	CL	A-4, A-6	0	0	100	98-100	90-100	80-95	25-40	8-20
	8-11	Silt loam--------	CL	A-4, A-6	0	0	100	98-100	90-100	80-95	20-35	5-15
	11-34	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	98-100	90-100	80-95	30-45	15-25
	34-42	Silt loam, loam, sandy loam.	CL	A-4, A-6	0	0	95-100	85-100	80-100	40-85	20-35	8-20
	42-60	Stratified silt loam to very fine sand.	ML, SC, CL, SM	A-2, A-6, A-4	0	0	90-100	80-100	70-100	30-85	15-40	NP-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
791B:												
Rush	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-95	25-35	5-20
	6-10	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	80-95	20-30	5-15
	10-34	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	90-100	70-100	30-40	10-20
	34-44	Clay loam, loam, gravelly sandy loam.	CL, SC	A-2-6, A-6	0	1-5	80-100	50-100	40-90	25-75	30-40	10-20
	44-60	Stratified sand to extremely gravelly coarse sand.	GP-GM, GP, SP, SP-SM	A-1	0-1	1-5	30-85	15-75	10-40	2-10	0-14	NP
792B:												
Bowes	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-20
	8-12	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-95	20-30	5-15
	12-37	Silty clay loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	85-100	35-45	15-25
	37-43	Gravelly clay loam, gravelly sandy loam, very gravelly loamy sand.	ML, SC, CL, SM	A-2, A-4, A-6	0-2	0-20	45-90	30-80	25-75	25-65	0-30	NP-15
	43-70	Sand and gravel	GP-GM, GP, SP, SP-SM	A-1	0-2	5-35	30-85	15-80	10-50	0-10	0-20	NP-3
802B:												
Orthents, loamy	0-6	Loam	CL	A-6	0-1	0-5	95-100	85-100	80-95	60-90	20-40	10-20
	6-60	Loam, silt loam, clay loam.	CL	A-6	0-1	0-5	95-100	80-100	75-95	60-90	20-40	10-20
802D:												
Orthents, loamy	0-6	Loam	CL	A-6	0-1	0-5	95-100	85-100	80-95	60-90	20-40	10-20
	6-60	Loam, silt loam, clay loam.	CL	A-6	0-1	0-5	95-100	80-100	75-95	60-90	20-40	10-20
805B:												
Orthents, clayey	0-6	Silty clay	CH	A-7	0	0	98-100	90-100	85-100	80-98	45-60	20-40
	6-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	0	98-100	85-100	80-98	75-95	40-55	25-45
830:												
Landfills.												
848B:												
Drummer	0-14	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	14-42	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	42-50	Silt loam, clay loam, sandy loam.	CL, SC	A-6, A-7	---	0-5	95-100	93-100	75-95	40-85	30-50	15-30
	50-60	Stratified loamy sand to silty clay loam.	CL, SC	A-4, A-2-4, A-6	---	0-5	95-100	80-98	75-95	15-85	20-35	7-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
848B:												
Barrington------	0-11	Silt loam--------	CL	A-4, A-6	0	0	100	95-100	90-100	80-95	30-40	8-18
	11-32	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	95-100	80-95	35-50	11-25
	32-42	Fine sandy loam, silt loam, clay loam.	CL, SC-SM	A-4, A-6, A-7	0	0	95-100	85-100	80-100	60-90	20-45	8-20
	42-60	Stratified fine sandy loam to very fine sand.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0	0	95-100	80-100	70-100	30-70	15-30	5-15
Mundelein-------	0-17	Silt loam--------	CL	A-4, A-7, A-6	0	0	98-100	95-100	95-100	85-95	25-45	5-20
	17-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	95-100	95-100	95-100	75-95	35-50	15-25
	31-42	Sandy loam, silt loam, clay loam.	CL, SC-SM	A-4, A-6, A-7	0	0	95-100	85-100	80-95	60-90	20-45	8-20
	42-60	Stratified silt loam to fine sand.	ML, SC, CL, SM	A-2, A-6, A-4	0	0	90-100	80-100	60-90	20-75	0-35	NP-20
849A:												
Milford---------	0-18	Silty clay loam--	CH, CL	A-7	0	0	100	95-100	90-100	75-95	40-55	20-30
	18-50	Silty clay, silty clay loam, clay loam.	CH, CL	A-7	0	0	100	95-100	90-100	75-100	40-60	20-40
	50-60	Stratified clay to sandy loam.	CL, SC	A-6, A-7	0	0	95-100	95-100	90-100	45-100	25-50	10-30
Martinton-------	0-17	Silt loam--------	CL	A-6, A-7	0	0	95-100	95-100	90-100	75-95	30-45	10-20
	17-42	Silty clay loam, silty clay.	CL	A-6, A-7	0	0	95-100	95-100	90-100	70-95	35-50	20-30
	42-60	Stratified sandy loam to silty clay.	CL, SC	A-6, A-7	0	0	90-100	80-100	75-100	35-90	25-45	10-25
854B:												
Markham---------	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0-1	0-5	95-100	95-100	90-100	85-95	23-40	6-17
	8-32	Silty clay, silty clay loam.	CH, CL	A-7	0-2	0-10	95-100	90-100	85-100	80-90	40-54	15-28
	32-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-2	0-10	95-100	85-100	80-95	75-90	30-45	13-26
Ashkum----------	0-12	Silty clay loam--	CH, CL	A-7	0	0	100	95-100	95-100	75-100	40-55	20-30
	12-29	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	90-100	85-100	75-100	45-65	20-35
	29-60	Silty clay loam--	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	75-95	35-50	15-30
Beecher---------	0-9	Silt loam--------	ML	A-6, A-4, A-7	0	0	95-100	95-100	90-100	85-95	30-45	7-15
	9-37	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	80-95	35-55	15-30
	37-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	85-100	80-95	75-90	28-50	10-25

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
864, 865:												
Pits.												
903A:												
Muskego	0-5	Muck	PT	A-8	0	0	---	---	---	---	---	---
	5-36	Muck	PT	A-8	0	0	---	---	---	---	---	---
	36-80	Coprogenous earth	OL	A-5	0	0	95-100	95-100	85-100	75-96	40-50	2-8
Houghton	0-12	Muck	PT	A-8	0	0	---	---	---	---	---	---
	12-60	Muck	PT	A-8	0	0	---	---	---	---	---	---
969F:												
Casco	0-8	Loam	CL, ML, CL-ML	A-4	0	0-9	90-100	85-100	65-95	50-80	20-30	3-10
	8-18	Clay loam, sandy clay loam, gravelly loam.	CL, GC, SC	A-6, A-2, A-7	0-1	0-9	55-100	50-100	40-90	20-80	25-46	11-26
	18-60	Stratified sand to extremely gravelly coarse sand.	GP-GM, SP, GP, SP-SM	A-1, A-2, A-3	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP
Rodman	0-8	Gravelly loam	ML, CL, SC, SM	A-4	0	0-2	75-95	65-80	60-75	36-65	0-30	3-9
	8-12	Gravelly loam, sandy loam, loam.	ML, SC, CL, SM	A-1, A-2, A-4	0	0-2	70-95	50-80	40-75	20-55	0-30	NP-10
	12-60	Stratified sand to extremely gravelly coarse sand.	GP-GM, SP, GP, SP-SM	A-1	0-1	1-5	30-70	15-50	7-20	2-10	0-14	NP
1107A:												
Sawmill	0-17	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	17-29	Silty clay loam	CL	A-6, A-7	0	0	100	98-100	95-100	85-100	30-50	15-30
	29-48	Silty clay loam, clay loam, loam.	CL	A-4, A-6, A-7	0	0	100	95-100	85-100	80-95	25-50	8-25
	48-60	Silty clay loam, clay loam, silt loam.	CL	A-4, A-6, A-7	0	0	100	85-100	75-100	65-95	20-50	8-30
1152A:												
Drummer	0-14	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	14-42	Silty clay loam, silt loam, silty clay.	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	42-50	Silt loam, clay loam, sandy loam.	CL, SC	A-6, A-7	---	0-5	95-100	93-100	75-95	40-85	30-50	15-30
	50-60	Stratified loamy sand to silty clay loam.	CL, SC	A-4, A-2-4, A-6	---	0-5	95-100	80-98	75-95	15-85	20-35	7-20
1330A:												
Peotone	0-13	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	90-100	40-65	15-35
	13-50	Silty clay loam, silty clay.	CH, CL	A-7	0	0-5	100	95-100	90-100	85-100	40-70	15-40
	50-60	Silty clay loam, silt loam, silty clay.	CH, CL	A-6, A-7	0	0-5	95-100	95-100	90-100	75-100	30-60	15-30

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1516A:												
Faxon	0-11	Silty clay loam	CL	A-7	0	0-10	95-100	85-100	85-100	80-95	40-50	15-25
	11-22	Loam, sandy loam, clay loam.	ML, SC, CL, SM	A-6, A-7	0	0-10	95-100	60-100	55-95	40-85	30-50	10-20
	22-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
1523A:												
Dunham	0-11	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	30-50	15-30
	11-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	98-100	90-100	85-95	35-45	15-25
	31-42	Clay loam, silt loam, gravelly sandy loam.	CL, SC	A-2, A-4, A-6	0	0-5	90-100	70-100	55-90	30-80	25-40	8-20
	42-60	Gravelly sand, extremely gravelly coarse sand.	GP-GM, SM, GM, SP-SM	A-1	0-3	0-10	35-90	15-80	10-40	2-25	0-14	NP
1903A:												
Muskego	0-5	Muck	PT	A-8	0	0	100	100	100	100	---	---
	5-36	Muck	PT	A-8	0	0	100	100	100	100	---	---
	36-60	Coprogenous earth	OL	A-5	0	0	95-100	95-100	85-100	75-96	40-50	2-8
Houghton	0-12	Muck	PT	A-8	0	0	---	---	---	---	---	---
	12-60	Muck	PT	A-8	0	0	---	---	---	---	---	---
3107A:												
Sawmill	0-17	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	17-29	Silty clay loam	CL	A-6, A-7	0	0	100	98-100	95-100	85-100	30-50	15-30
	29-48	Silty clay loam, clay loam, loam.	CL	A-4, A-7, A-6	0	0	100	95-100	85-100	80-95	25-50	8-25
	48-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4, A-7	0	0	100	85-100	75-100	65-95	20-50	8-30
3316A:												
Romeo	0-8	Silt loam	CL	A-4, A-6	0-3	0-15	90-100	80-100	75-100	50-85	30-40	8-15
	8-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
4904A:												
Muskego	0-5	Muck	PT	A-8	0	0	---	---	---	---	---	---
	5-36	Muck	PT	A-8	0	0	---	---	---	---	---	---
	36-60	Coprogenous earth	OL	A-5	0	0	95-100	95-100	85-100	75-96	40-50	2-8
Peotone	0-13	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	90-100	40-65	15-35
	13-50	Silty clay loam, silty clay.	CH, CL	A-7	0	0-5	100	95-100	90-100	85-100	40-70	15-40
	50-60	Silty clay loam, silt loam, silty clay.	CH, CL	A-6, A-7	0	0-5	95-100	95-100	90-100	75-100	30-60	15-30

Table 19.--Physical and Chemical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
23A:															
Blount--------	0-7	18-27	1.25-1.45	0.60-2.00	0.22-0.24	0.0-2.9	2.0-3.0	.32	.32	4	6	48	5.1-7.3	15-22	0
	7-13	15-27	1.30-1.50	0.60-2.00	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37				5.1-7.3	9-18	0
	13-26	35-48	1.40-1.70	0.06-0.60	0.12-0.19	3.0-5.9	0.2-1.0	.37	.37				4.5-6.5	21-31	0
	26-32	27-45	1.50-1.70	0.06-0.20	0.12-0.19	3.0-5.9	0.0-0.5	.37	.37				6.1-7.8	16-30	0-25
	32-60	27-40	1.70-2.00	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	16-25	22-35
23B:															
Blount--------	0-6	18-27	1.25-1.45	0.60-2.00	0.22-0.24	0.0-2.9	2.0-3.0	.32	.32	4	6	48	5.1-7.3	15-22	0
	6-10	15-27	1.30-1.50	0.60-2.00	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37				5.1-7.3	9-18	0
	10-23	35-48	1.40-1.70	0.06-0.60	0.12-0.19	3.0-5.9	0.2-1.0	.37	.37				4.5-6.5	21-31	0
	23-34	27-45	1.50-1.70	0.06-0.20	0.12-0.19	3.0-5.9	0.0-0.5	.37	.37				6.1-7.8	16-30	0-25
	34-60	27-40	1.70-2.00	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	16-25	22-35
67A:															
Harpster------	0-18	27-35	1.05-1.25	0.60-2.00	0.21-0.24	3.0-5.9	4.0-6.0	.24	.24	5	4L	86	7.4-8.4	24-33	10-40
	18-36	27-35	1.20-1.50	0.60-2.00	0.18-0.22	3.0-5.9	0.5-2.0	.37	.37				7.4-8.4	17-25	5-40
	36-41	22-35	1.25-1.55	0.60-2.00	0.17-0.22	3.0-5.9	0.5-1.0	.37	.37				7.4-8.4	14-23	5-40
	41-60	15-30	1.40-1.60	0.60-6.00	0.11-0.22	0.0-2.9	0.0-0.5	.32	.32				7.4-8.4	9-19	10-40
69A:															
Milford-------	0-18	35-40	1.30-1.50	0.60-2.00	0.20-0.23	6.0-8.9	4.0-6.0	.20	.20	5	4	86	5.6-7.3	26-36	0
	18-50	35-42	1.40-1.60	0.20-0.60	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	22-29	0-10
	50-60	20-30	1.50-1.70	0.20-0.60	0.20-0.22	3.0-5.9	0.0-1.0	.37	.37				6.6-8.4	4-18	0-30
91A:															
Swygert-------	0-12	27-40	1.25-1.50	0.20-0.60	0.18-0.22	3.0-5.9	3.0-5.0	.20	.20	4	7	38	5.6-7.3	22-34	0
	12-18	30-45	1.30-1.55	0.20-0.60	0.08-0.16	6.0-8.9	1.0-3.0	.32	.32				5.6-7.3	20-33	0
	18-51	45-50	1.40-1.70	0.06-0.20	0.05-0.12	6.0-8.9	0.5-1.0	.32	.32				6.6-8.4	28-32	0-20
	51-60	38-60	1.70-1.90	0.00-0.06	0.03-0.05	6.0-8.9	0.0-0.5	.37	.37				7.4-8.4	23-37	15-30
125A:															
Selma---------	0-16	20-27	1.40-1.60	0.60-2.00	0.20-0.24	0.0-2.9	4.0-6.0	.24	.24	5	6	48	6.1-7.8	20-28	0
	16-45	18-30	1.40-1.60	0.60-2.00	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32				6.1-8.4	11-22	0-20
	45-60	7-18	1.60-1.90	2.00-6.00	0.07-0.19	0.0-2.9	0.0-1.0	.28	.28				6.6-8.4	7-20	0-20
146A:															
Elliott-------	0-6	24-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	4	6	48	5.6-7.3	22-26	0
	6-11	27-35	1.15-1.35	0.60-2.00	0.21-0.23	3.0-5.9	3.0-4.0	.20	.20				5.6-7.3	22-29	0
	11-41	35-50	1.30-1.60	0.20-0.60	0.11-0.20	3.0-5.9	0.0-2.0	.37	.37				5.6-7.8	21-34	0-5
	41-60	27-40	1.70-1.90	0.06-0.20	0.07-0.10	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	16-25	10-40

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
146B:															
Elliott-------	0-9	24-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	4	6	48	5.6-7.3	22-26	0
	9-13	27-35	1.15-1.35	0.60-2.00	0.21-0.23	3.0-5.9	3.0-4.0	.20	.20				5.6-7.3	22-29	0
	13-35	35-50	1.30-1.60	0.20-0.60	0.11-0.20	3.0-5.9	0.0-2.0	.37	.37				5.6-7.8	21-34	0-5
	35-60	27-40	1.70-1.90	0.06-0.20	0.07-0.10	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	16-25	10-40
152A:															
Drummer-------	0-14	27-35	1.10-1.30	0.60-2.00	0.21-0.23	3.0-5.9	4.0-7.0	.24	.24	5	7	38	5.6-7.3	24-35	0
	14-42	20-35	1.20-1.45	0.60-2.00	0.21-0.24	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	13-25	0
	42-50	15-33	1.30-1.55	0.60-2.00	0.17-0.20	3.0-5.9	0.2-0.5	.32	.32				6.1-8.4	9-21	0-20
	50-60	10-32	1.40-1.70	0.60-6.00	0.11-0.19	0.0-2.9	0.0-0.5	.28	.28				6.6-8.4	6-20	0-40
189A:															
Martinton-----	0-17	20-27	1.20-1.40	0.60-2.00	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	5	6	48	5.6-7.3	18-24	0
	17-42	35-45	1.25-1.45	0.20-0.60	0.11-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	18-24	0-10
	42-60	15-42	1.40-1.60	0.20-0.60	0.11-0.22	3.0-5.9	0.0-0.5	.37	.37				6.1-8.4	7-22	5-30
192A:															
Del Rey-------	0-4	15-27	1.25-1.45	0.60-2.00	0.22-0.24	0.0-2.9	2.0-3.0	.32	.32	5	6	48	4.5-7.3	12-20	0
	4-9	15-25	1.30-1.50	0.60-2.00	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37				4.5-7.3	10-18	0
	9-41	35-45	1.40-1.65	0.06-0.20	0.12-0.20	3.0-5.9	0.0-1.0	.37	.37				4.5-8.4	18-24	0-10
	41-60	22-33	1.50-1.70	0.06-0.20	0.09-0.11	3.0-5.9	0.0-0.5	.43	.43				7.9-8.4	12-18	5-40
206A:															
Thorp---------	0-11	20-27	1.15-1.35	0.60-2.00	0.22-0.24	0.0-2.9	4.0-6.0	.28	.28	5	6	48	5.1-7.8	20-28	0
	11-15	18-25	1.30-1.50	0.20-0.60	0.20-0.22	0.0-2.9	0.2-1.0	.43	.43				5.1-7.3	11-17	0
	15-41	22-35	1.35-1.55	0.06-0.20	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37				5.1-7.3	14-23	0
	41-49	18-30	1.40-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.2-0.5	.32	.32				5.6-7.8	12-19	0-5
	49-60	5-30	1.50-1.70	0.60-6.00	0.05-0.13	0.0-2.9	0.0-0.5	.28	.28				6.1-8.4	3-19	0-20
223B:															
Varna---------	0-12	20-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	3.0-4.0	.24	.24	4	6	48	5.6-7.8	18-24	0
	12-48	35-50	1.30-1.60	0.20-0.60	0.09-0.19	3.0-5.9	0.5-1.0	.37	.37				5.6-7.8	22-32	0-15
	48-60	27-40	1.65-1.90	0.06-0.20	0.05-0.09	3.0-5.9	0.2-0.5	.43	.43				6.6-8.4	17-25	5-30
223C2:															
Varna---------	0-9	20-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	2.0-3.0	.24	.24	4	6	48	5.6-7.8	16-22	0
	9-40	35-50	1.30-1.60	0.20-0.60	0.09-0.19	3.0-5.9	0.5-1.0	.37	.37				5.6-7.8	22-30	0-15
	40-60	27-40	1.65-1.90	0.06-0.20	0.05-0.09	3.0-5.9	0.2-0.5	.43	.43				6.6-8.4	17-25	5-30
232A:															
Ashkum--------	0-12	35-40	1.15-1.35	0.20-0.60	0.15-0.20	6.0-8.9	3.0-7.0	.20	.20	5	4	86	5.6-7.8	27-38	0
	12-29	35-45	1.30-1.60	0.20-0.60	0.11-0.20	6.0-8.9	0.5-2.0	.32	.32				6.1-7.8	22-31	0-5
	29-60	30-40	1.45-1.75	0.20-0.60	0.09-0.18	3.0-5.9	0.0-0.5	.43	.43				6.1-8.4	18-25	0-25

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
290C2:															
Warsaw--------	0-8	15-25	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	2.0-4.0	.24	.24	4	5	56	5.6-7.3	10-25	0
	8-25	17-30	1.35-1.60	0.60-2.00	0.16-0.19	3.0-6.0	0.5-2.0	.32	.32				5.1-6.5	7-22	0
	25-29	18-30	1.40-1.65	0.60-2.00	0.13-0.16	0.0-2.9	0.5-2.0	.28	.32				6.1-8.4	9-22	0-10
	29-60	2-8	1.40-1.65	20-20	0.02-0.04	0.0-2.9	0.0-1.0	.02	.05				7.9-8.4	1-7	15-25
298A:															
Beecher-------	0-9	20-27	1.35-1.55	0.20-0.60	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48	4.5-7.3	16-24	0
	9-37	35-50	1.40-1.65	0.06-0.20	0.11-0.19	3.0-5.9	0.0-1.0	.37	.37				4.5-7.8	21-32	0-10
	37-60	25-45	1.65-1.85	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	15-28	5-30
298B:															
Beecher-------	0-7	20-27	1.35-1.55	0.20-0.60	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48	4.5-7.3	16-24	0
	7-36	35-50	1.40-1.65	0.06-0.20	0.11-0.19	3.0-5.9	0.0-1.0	.37	.37				4.5-7.8	21-32	0-10
	36-60	25-45	1.65-1.85	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	15-28	5-30
318C2:															
Lorenzo-------	0-7	18-27	1.25-1.40	0.60-2.00	0.20-0.22	0.0-2.9	2.0-3.0	.24	.24	3	6	48	5.6-7.3	11-19	0
	7-16	20-35	1.60-1.70	0.60-6.00	0.15-0.19	3.0-5.9	0.0-1.0	.28	.32				5.6-7.8	10-22	15-40
	16-60	1-5	1.60-1.80	20-20	0.02-0.07	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	1-3	15-40
318D2:															
Lorenzo-------	0-7	18-27	1.25-1.40	0.60-2.00	0.20-0.22	0.0-2.9	2.0-3.0	.24	.24	3	6	48	5.6-7.3	11-19	0
	7-16	20-35	1.60-1.70	0.60-6.00	0.15-0.19	3.0-5.9	0.0-1.0	.28	.32				5.6-7.8	10-22	15-40
	16-60	1-5	1.60-1.80	20-20	0.02-0.07	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	1-3	15-40
323C2:															
Casco---------	0-8	10-20	1.35-1.55	0.60-2.00	0.19-0.24	0.0-2.9	1.0-2.0	.32	.32	3	5	56	5.6-7.3	4-20	0
	8-18	18-35	1.55-1.65	0.60-2.00	0.09-0.19	3.0-5.9	0.0-0.5	.28	.32				5.6-7.8	4-30	0-3
	18-60	0-2	1.30-1.70	6.00-60.0	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	0-3	1-25
323D2:															
Casco---------	0-8	10-20	1.35-1.55	0.60-2.00	0.19-0.24	0.0-2.9	1.0-2.0	.32	.32	3	5	56	5.6-7.3	4-20	0
	8-18	18-35	1.55-1.65	0.60-2.00	0.09-0.19	3.0-5.9	0.0-0.5	.28	.32				5.6-7.8	4-30	0-3
	18-60	0-2	1.30-1.70	6.00-60.0	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	0-3	1-25
327B:															
Fox-----------	0-7	10-20	1.35-1.55	0.60-2.00	0.17-0.24	0.0-2.9	1.0-3.0	.32	.32	4	5	56	5.1-7.3	4-20	0
	7-32	18-35	1.55-1.65	0.60-2.00	0.10-0.19	3.0-5.9	0.0-0.5	.28	.32				5.6-7.8	4-30	0-45
	32-60	0-2	1.30-1.70	6.00-60.0	0.02-0.07	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	0-3	5-45
327C2:															
Fox-----------	0-7	10-20	1.35-1.55	0.60-2.00	0.17-0.24	0.0-2.9	1.0-2.0	.32	.32	4	5	56	5.1-7.3	4-20	0
	7-32	18-35	1.55-1.65	0.60-2.00	0.10-0.19	3.0-5.9	0.0-0.5	.28	.32				5.6-7.8	4-30	0-45
	32-60	0-2	1.30-1.70	6.00-60.0	0.02-0.07	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	0-3	5-45

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
330A:															
Peotone-------	0-13	33-40	1.20-1.40	0.20-0.60	0.21-0.23	6.0-8.9	5.0-7.0	.24	.24	5	4	86	5.6-7.8	30-38	0
	13-50	35-45	1.30-1.60	0.20-0.60	0.11-0.20	6.0-8.9	0.5-3.0	.37	.37				6.1-7.8	22-33	0
	50-60	25-42	1.40-1.65	0.20-0.60	0.18-0.20	6.0-8.9	0.2-0.5	.43	.43				6.6-8.4	15-26	0-15
369B:															
Waupecan------	0-11	15-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	3.0-5.0	.28	.28	4	6	48	6.1-7.8	17-26	0
	11-39	25-35	1.30-1.50	0.60-2.00	0.18-0.22	3.0-5.9	0.5-1.0	.37	.37				5.6-7.3	16-23	0
	39-45	10-25	1.55-1.75	2.00-6.00	0.08-0.18	0.0-2.9	0.2-0.5	.28	.32				5.6-7.3	6-16	0
	45-60	3-10	1.60-1.80	20-20	0.02-0.04	0.0-2.9	0.2-0.5	.02	.05				6.6-8.4	2-8	0-20
442A:															
Mundelein-----	0-17	20-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	3.0-5.0	.28	.28	5	6	48	5.6-7.3	18-26	0
	17-31	25-35	1.20-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	16-25	0-10
	31-42	15-30	1.40-1.55	0.60-2.00	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32				6.1-7.8	9-19	0-20
	42-60	5-25	1.50-1.70	0.60-6.00	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28				7.4-8.4	3-15	5-30
443B:															
Barrington----	0-11	20-27	1.20-1.40	0.60-2.00	0.22-0.26	0.0-2.9	3.0-5.0	.28	.28	5	6	48	5.6-7.3	18-26	0
	11-32	25-35	1.20-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	16-25	0-10
	32-42	15-30	1.40-1.55	0.60-2.00	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32				6.1-7.8	9-19	0-20
	42-60	5-25	1.50-1.70	0.60-6.00	0.07-0.15	0.0-2.9	0.0-0.2	.28	.28				7.4-8.4	3-15	5-30
494B:															
Kankakee------	0-14	15-30	1.35-1.60	0.60-2.00	0.18-0.22	0.0-2.9	2.0-4.0	.24	.24	4	5	56	5.6-7.8	8-19	0
	14-22	18-35	1.40-1.65	0.60-2.00	0.12-0.19	0.0-2.9	0.0-1.0	.32	.32				5.6-7.8	10-23	0
	22-60	5-20	1.45-1.70	2.00-6.00	0.05-0.13	0.0-2.9	0.0-0.5	.17	.24				6.1-8.4	3-19	0-20
503B:															
Rockton-------	0-11	18-27	1.30-1.40	0.60-2.00	0.20-0.22	0.0-2.9	3.0-5.0	.28	.28	3	6	48	5.1-7.3	14-28	0
	11-35	25-35	1.40-1.55	0.60-2.00	0.17-0.19	3.0-5.9	0.5-2.0	.32	.32				5.1-7.3	16-25	0
	35-60	---	---	2.00-20.0	---	---	---	---	---				---	---	---
523A:															
Dunham--------	0-11	27-35	1.10-1.30	0.60-2.00	0.21-0.23	3.0-5.9	4.0-6.0	.24	.24	4	7	38	5.6-7.3	25-34	0
	11-31	23-35	1.30-1.50	0.60-2.00	0.18-0.21	3.0-5.9	0.5-2.0	.37	.37				5.6-7.3	16-26	0
	31-42	10-30	1.35-1.60	0.60-2.00	0.15-0.20	3.0-5.9	0.0-0.5	.28	.32				6.1-7.8	6-19	0-20
	42-60	1-10	1.60-1.85	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	1-7	15-40
526A:															
Grundelein----	0-13	18-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	4.0-5.0	.28	.28	4	6	48	5.6-7.3	19-30	0
	13-29	22-35	1.25-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.3	16-26	0
	29-43	10-30	1.35-1.60	0.60-2.00	0.15-0.20	3.0-5.9	0.0-0.5	.28	.32				6.1-7.8	6-19	0-20
	43-60	1-10	1.60-1.85	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	1-7	15-40

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
530B:															
Ozaukee-------	0-4	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48	6.1-7.3	11-22	0
	4-10	15-27	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37				5.6-7.3	9-18	0
	10-39	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37				6.1-8.4	21-31	0-20
	39-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.9-8.4	16-22	10-40
530C2:															
Ozaukee-------	0-6	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48	6.1-7.3	11-20	0
	6-28	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37				6.1-8.4	21-31	0-20
	28-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.9-8.4	16-22	10-40
530D2:															
Ozaukee-------	0-6	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48	6.1-7.3	11-20	0
	6-28	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37				6.1-8.4	21-31	0-20
	28-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.9-8.4	16-22	10-40
530D3:															
Ozaukee-------	0-7	27-40	1.45-1.60	0.20-0.60	0.10-0.21	3.0-5.9	0.5-1.0	.37	.37	3	6	48	6.1-7.8	17-26	0
	7-25	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37				6.1-8.4	21-31	0-20
	25-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.9-8.4	16-22	10-40
530E:															
Ozaukee-------	0-4	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48	6.1-7.3	11-22	0
	4-10	15-27	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37				5.6-7.3	9-18	0
	10-39	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37				6.1-8.4	21-31	0-20
	39-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.9-8.4	16-22	10-40
530F:															
Ozaukee-------	0-4	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48	6.1-7.3	11-22	0
	4-10	15-27	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37				5.6-7.3	9-18	0
	10-39	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	0.2-0.5	.37	.37				6.1-8.4	21-31	0-20
	39-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.9-8.4	16-22	10-40
531B:															
Markham-------	0-8	22-27	1.10-1.40	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48	5.6-6.5	17-24	0
	8-32	35-45	1.40-1.60	0.06-0.60	0.11-0.20	3.0-5.9	0.2-1.0	.37	.37				5.1-7.8	21-29	0-10
	32-60	27-38	1.65-1.85	0.06-0.20	0.05-0.10	3.0-5.9	0.2-0.5	.43	.43				7.4-8.4	16-24	5-30
531C2:															
Markham-------	0-8	22-27	1.10-1.40	0.60-2.00	0.22-0.24	0.0-2.9	2.0-3.0	.28	.28	4	6	48	5.6-6.5	17-22	0
	8-29	35-45	1.40-1.60	0.06-0.60	0.11-0.20	3.0-5.9	0.2-1.0	.37	.37				5.1-7.8	21-29	0-10
	29-60	27-38	1.65-1.85	0.06-0.20	0.05-0.10	3.0-5.9	0.2-0.5	.43	.43				7.4-8.4	16-24	5-30
535B:															
Orthents,															
stony--------	0-6	15-30	1.70-1.90	0.20-2.00	0.18-0.22	0.0-2.9	0.5-1.0	.37	.43	5	8	0	7.4-8.4	10-22	5-20
	6-60	15-30	1.70-1.90	0.20-2.00	0.15-0.20	0.0-2.9	0.0-0.2	.37	.43				7.4-8.4	8-18	10-30

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
541B:															
Graymont------	0-12	22-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	4.0-5.0	.28	.28	5	6	48	6.1-7.3	21-24	0
	12-33	25-35	1.25-1.45	0.60-2.00	0.16-0.20	3.0-5.9	0.0-2.0	.37	.37				5.6-7.3	16-27	0
	33-38	25-40	1.50-1.75	0.06-0.20	0.14-0.18	3.0-5.9	0.0-0.5	.37	.37				6.6-7.8	15-25	0-10
	38-60	22-40	1.50-1.75	0.06-0.20	0.14-0.18	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	10-24	5-30
557A:															
Millstream----	0-8	18-27	1.20-1.35	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	4	6	48	5.1-7.3	14-24	0
	8-13	15-27	1.25-1.40	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43				5.1-7.3	10-18	0
	13-30	22-35	1.25-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37				5.1-7.3	14-23	0
	30-46	10-30	1.35-1.60	0.60-6.00	0.09-0.20	3.0-5.9	0.0-0.5	.28	.32				5.6-7.8	6-19	0-20
	46-65	1-10	1.60-1.85	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	1-7	15-40
614A:															
Chenoa--------	0-12	27-32	1.10-1.30	0.60-2.00	0.21-0.23	3.0-5.9	4.0-5.0	.28	.28	5	7	38	5.6-7.3	24-29	0
	12-32	27-45	1.25-1.45	0.60-2.00	0.16-0.20	3.0-5.9	0.0-2.0	.37	.37				5.6-7.3	16-29	0
	32-36	25-40	1.50-1.75	0.06-0.20	0.14-0.20	3.0-5.9	0.0-0.5	.37	.37				6.1-7.8	15-25	0-10
	36-60	25-40	1.50-1.75	0.06-0.20	0.14-0.20	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	15-25	5-40
696B:															
Zurich--------	0-5	15-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48	5.6-7.3	13-22	0
	5-9	15-25	1.20-1.35	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.49	.49				5.6-7.3	9-20	0
	9-28	25-35	1.35-1.55	0.60-2.00	0.18-0.22	3.0-5.9	0.5-1.0	.37	.37				5.1-7.8	15-22	0-5
	28-38	8-25	1.40-1.55	0.60-2.00	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32				6.6-7.8	11-16	0-20
	38-60	5-20	1.40-1.70	0.60-6.00	0.07-0.15	0.0-2.9	0.0-0.2	.28	.28				7.4-8.4	3-12	5-30
696C2:															
Zurich--------	0-8	15-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	5	6	48	5.6-7.3	13-22	0
	8-28	25-35	1.35-1.55	0.60-2.00	0.18-0.22	3.0-5.9	0.5-1.0	.37	.37				5.1-7.8	15-22	0-5
	28-34	8-25	1.40-1.55	0.60-2.00	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32				6.6-7.8	11-16	0-20
	34-60	5-20	1.40-1.70	0.60-6.00	0.07-0.15	0.0-2.9	0.0-0.2	.28	.28				7.4-8.4	3-12	5-30
697A:															
Wauconda------	0-9	15-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48	5.6-7.3	13-24	0
	9-14	15-25	1.20-1.35	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43				5.6-7.3	9-20	0
	14-30	27-35	1.20-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37				5.6-7.8	16-23	0-5
	30-38	8-25	1.40-1.55	0.60-2.00	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32				6.6-8.4	9-19	0-20
	38-60	5-20	1.50-1.70	0.60-6.00	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28				7.4-8.4	3-13	5-30
698B:															
Grays---------	0-8	18-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48	5.6-7.3	16-22	0
	8-11	15-27	1.20-1.35	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43				5.6-7.3	9-20	0
	11-34	25-35	1.20-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37				5.6-7.8	15-22	0-5
	34-42	8-25	1.40-1.55	0.60-2.00	0.18-0.20	0.0-2.9	0.2-0.5	.32	.32				6.6-8.4	11-16	0-20
	42-60	5-20	1.50-1.70	0.60-6.00	0.14-0.22	0.0-2.9	0.0-0.2	.28	.28				7.4-8.4	3-12	10-40

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
791B:															
Rush----------	0-6	15-27	1.20-1.35	0.60-2.00	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	4	6	48	5.1-7.3	13-22	0
	6-10	15-25	1.25-1.40	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.49	.49				5.1-7.3	9-20	0
	10-34	22-30	1.35-1.50	0.60-2.00	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37				4.5-6.5	15-22	0
	34-44	20-30	1.40-1.55	0.60-2.00	0.15-0.19	3.0-5.9	0.2-1.0	.28	.32				4.5-6.5	9-20	0
	44-60	2-6	1.60-1.80	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	1-5	10-35
792B:															
Bowes---------	0-8	18-27	1.30-1.50	0.60-2.00	0.22-0.25	0.0-2.9	2.0-4.0	.37	.37	4	6	48	5.1-7.3	16-24	0
	8-12	15-25	1.35-1.50	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43				5.1-7.3	9-20	0
	12-37	27-35	1.30-1.50	0.60-2.00	0.18-0.20	3.0-5.9	0.0-1.0	.37	.37				5.1-6.5	16-23	0
	37-43	10-30	1.55-1.75	0.60-6.00	0.10-0.16	0.0-2.9	0.0-0.5	.28	.32				5.1-8.4	6-18	0-10
	43-70	3-10	1.60-1.80	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	2-7	10-40
802B:															
Orthents, loamy--------	0-6	22-27	1.70-1.75	0.20-0.60	0.18-0.22	3.0-5.9	0.5-2.0	.43	.43	5	6	48	5.6-7.8	10-25	0-10
	6-60	22-30	1.70-1.80	0.20-0.60	0.16-0.20	3.0-5.9	0.2-1.0	.43	.43				5.6-8.4	10-20	0-20
802D:															
Orthents, loamy--------	0-6	22-27	1.70-1.75	0.20-0.60	0.18-0.22	3.0-5.9	0.5-2.0	.43	.43	5	6	48	5.6-7.8	10-25	0-10
	6-60	22-30	1.70-1.80	0.20-0.60	0.16-0.20	3.0-5.9	0.2-1.0	.43	.43				5.6-8.4	10-20	0-20
805B:															
Orthents, clayey-------	0-6	40-60	1.50-1.65	0.00-0.06	0.08-0.14	6.0-9.0	0.5-2.0	.43	.43	5	4	86	5.6-7.8	22-38	0-10
	6-60	35-60	1.60-1.90	0.00-0.06	0.03-0.10	6.0-9.0	0.2-1.0	.43	.43				6.1-8.4	15-35	0-25
830:															
Landfills.															
848B:															
Drummer-------	0-14	27-35	1.10-1.30	0.60-2.00	0.21-0.23	3.0-5.9	4.0-7.0	.24	.24	5	7	38	5.6-7.3	24-35	0
	14-42	20-35	1.20-1.45	0.60-2.00	0.21-0.24	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	13-25	0
	42-50	15-33	1.30-1.55	0.60-2.00	0.17-0.20	3.0-5.9	0.2-0.5	.32	.32				6.1-8.4	9-21	0-20
	50-60	10-32	1.40-1.70	0.60-6.00	0.11-0.19	0.0-2.9	0.0-0.5	.28	.28				6.6-8.4	6-20	0-40
Barrington----	0-11	20-27	1.20-1.40	0.60-2.00	0.22-0.26	0.0-2.9	3.0-5.0	.28	.28	5	6	48	5.6-7.3	18-26	0
	11-32	25-35	1.20-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	16-25	0-10
	32-42	15-30	1.40-1.55	0.60-2.00	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32				6.1-7.8	9-19	0-20
	42-60	5-25	1.50-1.70	0.60-6.00	0.07-0.15	0.0-2.9	0.0-0.2	.28	.28				7.4-8.4	3-15	5-30
Mundelein-----	0-17	20-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	3.0-5.0	.28	.28	5	6	48	5.6-7.3	18-26	0
	17-31	25-35	1.20-1.45	0.60-2.00	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	16-25	0-10
	31-42	15-30	1.40-1.55	0.60-2.00	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32				6.1-7.8	9-19	0-20
	42-60	5-25	1.50-1.70	0.60-6.00	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28				7.4-8.4	3-15	5-30

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
849A:															
Milford-------	0-18	35-40	1.30-1.50	0.60-2.00	0.20-0.23	6.0-8.9	4.0-6.0	.20	.20	5	4	86	5.6-7.3	26-36	0
	18-50	35-42	1.40-1.60	0.20-0.60	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	22-29	0-10
	50-60	20-30	1.50-1.70	0.20-0.60	0.20-0.22	3.0-5.9	0.0-1.0	.37	.37				6.6-8.4	4-18	0-30
Martinton-----	0-17	20-27	1.20-1.40	0.60-2.00	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	5	6	48	5.6-7.3	18-24	0
	17-42	35-45	1.25-1.45	0.20-0.60	0.11-0.20	3.0-5.9	0.5-2.0	.37	.37				5.6-7.8	18-24	0-10
	42-60	15-42	1.40-1.60	0.20-0.60	0.11-0.22	3.0-5.9	0.0-0.5	.37	.37				6.1-8.4	7-22	5-30
854B:															
Markham-------	0-8	22-27	1.10-1.40	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48	5.6-6.5	17-24	0
	8-32	35-45	1.40-1.60	0.06-0.60	0.11-0.20	3.0-5.9	0.2-1.0	.37	.37				5.1-7.8	21-29	0-10
	32-60	27-38	1.65-1.85	0.06-0.20	0.05-0.10	3.0-5.9	0.2-0.5	.43	.43				7.4-8.4	16-24	5-30
Ashkum--------	0-12	35-40	1.15-1.35	0.20-0.60	0.15-0.20	6.0-8.9	3.0-7.0	.20	.20	5	4	86	5.6-7.8	27-38	0
	12-29	35-45	1.30-1.60	0.20-0.60	0.11-0.20	6.0-8.9	0.5-2.0	.32	.32				6.1-7.8	22-31	0-5
	29-60	30-40	1.45-1.75	0.20-0.60	0.09-0.18	3.0-5.9	0.0-0.5	.43	.43				6.1-8.4	18-25	0-25
Beecher-------	0-9	20-27	1.35-1.55	0.20-0.60	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48	4.5-7.3	16-24	0
	9-37	35-50	1.40-1.65	0.06-0.20	0.11-0.19	3.0-5.9	0.0-1.0	.37	.37				4.5-7.8	21-32	0-10
	37-60	25-45	1.65-1.85	0.06-0.20	0.05-0.10	3.0-5.9	0.0-0.5	.43	.43				7.4-8.4	15-28	5-30
864, 865:															
Pits.															
903A:															
Muskego-------	0-5	0-0	0.10-0.21	0.60-6.00	0.35-0.45	---	60-90	---	---	1	2	134	5.6-7.3	140-180	0
	5-36	0-0	0.10-0.21	0.60-6.00	0.35-0.45	---	60-90	.10	.10				5.6-7.3	150-190	0
	36-80	18-35	0.30-1.10	0.06-0.20	0.18-0.24	3.0-5.9	6.0-20	.28	.28				6.6-8.4	10-45	60-80
Houghton------	0-12	0-0	0.20-0.35	0.20-6.00	0.35-0.45	---	70-99	---	---	3	2	134	4.5-7.8	140-200	0
	12-60	0-0	0.15-0.25	0.20-6.00	0.35-0.45	---	70-99	---	---				4.5-7.8	100-200	0
969F:															
Casco---------	0-8	10-20	1.35-1.55	0.60-2.00	0.19-0.24	0.0-2.9	1.0-3.0	.32	.32	3	5	56	5.6-7.3	4-20	0
	8-18	18-35	1.55-1.65	0.60-2.00	0.09-0.19	3.0-5.9	0.0-0.5	.28	.32				5.6-7.8	4-30	0-3
	18-60	0-2	1.30-1.70	6.00-60.0	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	0-3	1-25
Rodman--------	0-8	8-25	1.20-1.50	2.00-6.00	0.10-0.12	0.0-2.9	2.0-4.0	.20	.24	3	8	0	6.6-7.8	5-18	0-15
	8-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	0.0-2.9	0.0-2.0	.28	.32				6.6-7.8	1-14	0-25
	12-60	0-10	1.60-1.70	20-20	0.02-0.04	0.0-2.9	0.0-1.0	.02	.05				7.4-8.4	1-6	10-45
1107A:															
Sawmill-------	0-17	27-35	1.20-1.40	0.60-2.00	0.21-0.23	3.0-5.9	4.0-5.0	.28	.28	5	7	38	6.1-7.8	24-31	0
	17-29	27-35	1.20-1.40	0.60-2.00	0.21-0.23	3.0-5.9	1.0-3.0	.28	.28				6.1-7.8	18-27	0
	29-48	25-35	1.30-1.45	0.60-2.00	0.17-0.20	3.0-5.9	0.2-2.0	.32	.32				6.1-7.8	17-25	0-10
	48-60	18-35	1.35-1.50	0.60-2.00	0.15-0.19	3.0-5.9	0.2-1.0	.32	.32				6.1-8.4	11-23	0-30

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
1152A:															
Drummer-------	0-14	27-35	1.10-1.30	0.60-2.00	0.21-0.23	3.0-5.9	4.0-7.0	.24	.24	5	7	38	5.6-7.3	24-35	0
	14-42	20-35	1.20-1.45	0.60-2.00	0.21-0.24	3.0-5.9	0.5-2.0	.37	.37				5.6-7.3	13-25	0
	42-50	15-33	1.30-1.55	0.60-2.00	0.17-0.20	3.0-5.9	0.2-0.5	.32	.32				6.1-8.4	9-21	0-20
	50-60	10-32	1.40-1.70	0.60-6.00	0.11-0.19	0.0-2.9	0.0-5.0	.28	.28				6.6-8.4	6-20	0-40
1330A:															
Peotone-------	0-13	33-40	1.20-1.40	0.20-0.60	0.21-0.23	6.0-8.9	5.0-7.0	.24	.24	5	4	86	5.6-7.8	30-38	0
	13-50	35-45	1.30-1.60	0.20-0.60	0.11-0.20	6.0-8.9	0.5-3.0	.37	.37				6.1-7.8	22-33	0
	50-60	25-42	1.40-1.65	0.20-0.60	0.18-0.20	6.0-8.9	0.2-0.5	.43	.43				6.6-8.4	15-26	0-15
1516A:															
Faxon---------	0-11	28-30	1.20-1.40	0.60-2.00	0.20-0.24	3.0-5.9	3.0-7.0	.28	.28	2	7	38	6.6-7.8	22-32	0
	11-22	18-30	1.40-1.60	0.60-2.00	0.12-0.19	3.0-5.9	0.5-2.0	.28	.32				6.6-7.8	10-22	0-10
	22-60	---	---	2.00-20.0	---	---	---	---	---				---	---	---
1523A:															
Dunham--------	0-11	27-35	1.10-1.30	0.60-2.00	0.21-0.23	3.0-5.9	4.0-6.0	.24	.24	4	7	38	5.6-7.3	25-34	0
	11-31	23-35	1.30-1.50	0.60-2.00	0.18-0.21	3.0-5.9	0.5-2.0	.37	.37				5.6-7.3	16-26	0
	31-42	10-30	1.35-1.60	0.60-2.00	0.15-0.20	3.0-5.9	0.0-0.5	.28	.32				6.1-7.8	6-19	0-20
	42-60	1-5	1.60-1.85	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05				7.4-8.4	1-7	15-40
1903A:															
Muskego-------	0-5	0-0	0.10-0.21	0.60-6.00	0.35-0.45	---	60-90	.10	.10	1	2	134	5.6-7.3	140-180	0
	5-36	0-0	0.10-0.21	0.60-6.00	0.35-0.45	---	60-90	.10	.10				5.6-7.3	150-190	0
	36-60	18-35	0.30-1.10	0.06-0.20	0.18-0.24	3.0-5.9	6.0-20	.28	.28				6.6-8.4	10-45	60-80
Houghton------	0-12	0-0	0.20-0.35	0.20-6.00	0.35-0.45	---	70-99	---	---	3	2	134	4.5-7.8	140-200	0
	12-60	0-0	0.15-0.25	0.20-6.00	0.35-0.45	---	70-99	---	---				4.5-7.8	100-200	0
3107A:															
Sawmill-------	0-17	27-35	1.20-1.40	0.60-2.00	0.21-0.23	3.0-5.9	4.0-5.0	.28	.28	5	7	38	6.1-7.8	24-31	0
	17-29	27-35	1.20-1.40	0.60-2.00	0.21-0.23	3.0-5.9	1.0-3.0	.28	.28				6.1-7.8	18-27	0
	29-48	25-35	1.30-1.45	0.60-2.00	0.17-0.20	3.0-5.9	0.2-2.0	.32	.32				6.1-7.8	17-25	0-10
	48-60	18-35	1.35-1.50	0.60-2.00	0.15-0.19	3.0-5.9	0.2-1.0	.32	.32				6.1-8.4	11-23	0-30
3316A:															
Romeo---------	0-8	15-27	1.20-1.30	0.60-2.00	0.22-0.24	0.0-2.9	3.0-5.0	.32	.32	1	6	48	6.1-8.4	15-26	0-20
	8-60	---	---	0.01-0.06	---	---	---	---	---				---	---	---

Table 19.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index	Soil reaction	Cation-exchange capacity	Calcium carbonate
								Kw	Kf	T					
	In	Pct	g/cc	In/hr	In/in	Pct	Pct						pH	meq/100g	Pct
4904A:															
Muskego-------	0-5	0-0	0.10-0.21	0.60-6.00	0.35-0.45	---	60-90	.10	.10	1	2	134	5.6-7.3	140-180	0
	5-36	0-0	0.10-0.21	0.60-6.00	0.35-0.45	---	60-90	.10	.10				5.6-7.3	150-190	0
	36-60	18-35	0.30-1.10	0.06-0.20	0.18-0.24	3.0-5.9	6.0-20	.28	.28				6.6-8.4	10-45	60-80
Peotone-------	0-13	33-40	1.20-1.40	0.20-0.60	0.21-0.23	6.0-8.9	5.0-7.0	.24	.24	5	4	86	5.6-7.8	30-38	0
	13-50	35-45	1.30-1.60	0.20-0.60	0.11-0.20	6.0-8.9	0.5-3.0	.37	.37				6.1-7.8	22-33	0
	50-60	25-42	1.40-1.65	0.20-0.60	0.18-0.20	6.0-8.9	0.2-0.5	.43	.43				6.6-8.4	15-26	0-15

Table 20.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the entire year rather than to individual months or groups of months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
23A:									
Blount	C	Jan-May	0.5-2.0	2.0-4.0	---	---	---	---	---
23B:									
Blount	C	Jan-May	0.5-2.0	2.0-4.0	---	---	---	---	---
67A:									
Harpster	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
69A:									
Milford	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
91A:									
Swygert	C	Jan-May	1.0-2.0	2.0-5.0	---	---	---	---	---
125A:									
Selma	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
146A:									
Elliott	C	Jan-May	1.0-2.0	2.0-4.0	---	---	---	---	---
146B:									
Elliott	C	Jan-May	1.0-2.0	2.0-4.0	---	---	---	---	---
152A:									
Drummer	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
189A:									
Martinton	C	Jan-May	1.0-2.0	>6.0	---	---	---	---	---
192A:									
Del Rey	C	Jan-May	0.5-2.0	2.0-4.5	---	---	---	---	---
206A:									
Thorp	C	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
223B:									
Varna	C	Feb-Apr	2.0-3.5	3.5-5.0	---	---	---	---	---
223C2:									
Varna	C	Feb-Apr	2.0-3.5	3.5-5.0	---	---	---	---	---
232A:									
Ashkum	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
290C2:									
Warsaw	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
298A:									
Beecher	C	Jan-May	0.5-2.0	2.0-4.0	---	---	---	---	---
298B:									
Beecher	C	Jan-May	0.5-2.0	2.0-4.0	---	---	---	---	---
318C2:									
Lorenzo	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---

Table 20.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
318D2:									
Lorenzo	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
323C2:									
Casco	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
323D2:									
Casco	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
327B:									
Fox	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
327C2:									
Fox	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
330A:									
Peotone	B	Jan-Jun	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
369B:									
Waupecan	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
442A:									
Mundelein	B	Jan-May	1.0-2.0	>6.0	---	---	---	---	---
443B:									
Barrington	B	Feb-Apr	2.0-3.5	>6.0	---	---	---	---	---
494B:									
Kankakee	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
503B:									
Rockton	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
523A:									
Dunham	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
526A:									
Grundelein	B	Jan-May	1.0-2.0	>6.0	---	---	---	---	---
530B:									
Ozaukee	C	Feb-Apr	2.0-3.5	3.5-4.0	---	---	---	---	---
530C2:									
Ozaukee	C	Feb-Apr	2.0-3.5	3.5-4.0	---	---	---	---	---
530D2:									
Ozaukee	C	Feb-Apr	2.0-3.5	3.5-4.0	---	---	---	---	---
530D3:									
Ozaukee	C	Feb-Apr	2.0-3.5	3.5-4.0	---	---	---	---	---
530E:									
Ozaukee	C	Feb-Apr	2.0-3.5	3.5-4.0	---	---	---	---	---
530F:									
Ozaukee	C	Feb-Apr	2.0-3.5	3.5-4.0	---	---	---	---	---
531B:									
Markham	C	Feb-Apr	2.0-3.5	3.5-5.0	---	---	---	---	---

Table 20.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
531C2:									
Markham	C	Feb-Apr	2.0-3.5	3.5-5.0	---	---	---	---	---
535B:									
Orthents, stony	B	Feb-Apr	4.0-6.0	>6.0	---	---	---	---	---
541B:									
Graymont	B	Feb-Apr	2.0-3.5	3.5-4.0	---	---	---	---	---
557A:									
Millstream	B	Jan-May	1.0-2.0	>6.0	---	---	---	---	---
614A:									
Chenoa	B	Jan-May	1.0-2.0	2.0-4.0	---	---	---	---	---
696B:									
Zurich	B	Feb-Apr	2.0-3.5	>6.0	---	---	---	---	---
696C2:									
Zurich	B	Feb-Apr	2.0-3.5	>6.0	---	---	---	---	---
697A:									
Wauconda	B	Jan-May	0.5-2.0	>6.0	---	---	---	---	---
698B:									
Grays	B	Feb-Apr	2.0-3.5	>6.0	---	---	---	---	---
791B:									
Rush	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
792B:									
Bowes	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
802B:									
Orthents, loamy	B	Feb-Apr	3.5-5.0	5.0-6.0	---	---	---	---	---
802D:									
Orthents, loamy	B	Feb-Apr	3.5-5.0	5.0-6.0	---	---	---	---	---
805B:									
Orthents, clayey	C	Feb-Apr	2.0-3.5	3.5-5.0	---	---	---	---	---
848B:									
Drummer	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
Barrington	B	Feb-Apr	2.0-3.5	>6.0	---	---	---	---	---
Mundelein	B	Jan-May	1.0-2.0	>6.0	---	---	---	---	---
849A:									
Milford	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
Martinton	C	Jan-May	1.0-2.0	>6.0	---	---	---	---	---
854B:									
Markham	C	Feb-Apr	2.0-3.5	3.5-5.0	---	---	---	---	---
Ashkum	B	Jan-May	0.0-1.0	>6.0	0.0-0.5	Brief	Frequent	---	---
Beecher	C	Jan-May	0.5-2.0	2.0-4.0	---	---	---	---	---

Table 20.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
864, 865:									
Pits.									
903A:									
Muskego	A	Dec-Apr	0.0-1.0	>6.0	0.0-1.0	Long	Frequent	---	---
		May-Jun	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	---
		Nov	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	---
Houghton	A	Dec-Apr	0.0-1.0	>6.0	0.0-1.0	Long	Frequent	---	---
		May-Jun	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	---
		Nov	0.0-1.0	>6.0	0.0-1.0	Brief	Frequent	---	---
969F:									
Casco	B	Jan-Dec	>6.0	>6.0	---	---	---	---	---
Rodman	A	Jan-Dec	>6.0	>6.0	---	---	---	---	---
1107A:									
Sawmill	D	Nov-Jun	0.0-0.5	>6.0	---	---	---	Long	Frequent.
1152A:									
Drummer	D	Dec-May	0.0-0.5	>6.0	0.0-0.5	Long	Frequent	---	---
		Jun	0.0-0.5	>6.0	0.0-0.5	Brief	Frequent	---	---
		Nov	0.0-0.5	>6.0	0.0-0.5	Brief	Frequent	---	---
1330A:									
Peotone	D	Dec-May	0.0-0.5	>6.0	0.0-1.0	Long	Frequent	---	---
		Jun-Nov	0.0-0.5	>6.0	0.0-1.0	Brief	Frequent	---	---
1516A:									
Faxon	D	Nov-Jun	0.0-0.5	0.5-3.5	---	---	---	Long	Frequent.
1523A:									
Dunham	D	Dec-May	0.0-0.5	>6.0	0.0-0.5	Long	Frequent	---	---
		Jun	0.0-0.5	>6.0	0.0-0.5	Brief	Frequent	---	---
		Nov	0.0-0.5	>6.0	0.0-0.5	Brief	Frequent	---	---
1903A:									
Muskego	D	Dec-Apr	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	---	---
		May-Jun	0.0-0.5	>6.0	0.0-1.0	Long	Frequent	---	---
		Jul-Oct	0.0-0.5	>6.0	0.0-1.0	Brief	Frequent	---	---
		Nov	0.0-0.5	>6.0	0.0-1.0	Long	Frequent	---	---
Houghton	D	Dec-Apr	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	---	---
		May-Jun	0.0-0.5	>6.0	0.0-1.0	Long	Frequent	---	---
		Jul-Oct	0.0-0.5	>6.0	0.0-1.0	Brief	Frequent	---	---
		Nov	0.0-0.5	>6.0	0.0-1.0	Long	Frequent	---	---
3107A:									
Sawmill	B	Jan-May	0.0-1.0	>6.0	---	---	---	Brief	Frequent.
		June	---	---	---	---	---	Brief	Frequent.
		Nov-Dec	---	---	---	---	---	Brief	Frequent.
3316A:									
Romeo	D	Jan-May	0.0-0.5	0.5-1.0	0.0-0.5	Brief	Frequent	Brief	Frequent.
		Jun	---	---	---	---	---	Brief	Frequent.
		Nov-Dec	---	---	---	---	---	Brief	Frequent.

Table 20.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
4904A:									
Muskego	D	Dec-May	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	---	---
		Jun-Nov	0.0-0.5	>6.0	0.0-1.0	Long	Frequent	---	---
Peotone	D	Dec-May	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	---	---
		Jun-Nov	0.0-0.5	>6.0	0.0-1.0	Long	Frequent	---	---

Table 21.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
23A, 23B:									
Blount	Dense material	30-48	---	---	---	---	High	High	High.
67A:									
Harpster	---	>80	---	---	---	---	High	High	Low.
69A:									
Milford	---	>80	---	---	---	---	High	High	Low.
91A:									
Swygert	Dense material	35-55	---	---	---	---	Moderate	High	Low.
125A:									
Selma	---	>80	---	---	---	---	High	High	Low.
146A, 146B:									
Elliott	Dense material	20-45	---	---	---	---	Moderate	High	Moderate.
152A:									
Drummer	---	>80	---	---	---	---	High	High	Moderate.
189A:									
Martinton	---	>80	---	---	---	---	Moderate	High	Moderate.
192A:									
Del Rey	---	>80	---	---	---	---	High	High	Moderate.
206A:									
Thorp	---	>80	---	---	---	---	High	High	Moderate.
223B, 223C2:									
Varna	Dense material	24-60	---	---	---	---	Moderate	Moderate	Moderate.
232A:									
Ashkum	---	>80	---	---	---	---	High	High	Moderate.
290C2:									
Warsaw	---	>80	---	---	---	---	Moderate	Low	Moderate.
298A, 298B:									
Beecher	Dense material	24-45	---	---	---	---	High	High	High.

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
318C2, 318D2:									
Lorenzo	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
323C2, 323D2:									
Casco	---	>80	---	---	---	---	Moderate	Moderate	Low.
327B, 327C2:									
Fox	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
330A:									
Peotone	---	>80	---	---	---	---	High	High	Moderate.
369B:									
Waupecan	---	>80	---	---	---	---	High	Moderate	Moderate.
442A:									
Mundelein	---	>80	---	---	---	---	High	High	Moderate.
443B:									
Barrington	---	>80	---	---	---	---	High	Moderate	Moderate.
494B:									
Kankakee	---	>80	---	---	---	---	Moderate	Low	Low.
503B:									
Rockton	Bedrock (paralithic).	20-40	---	Indurated	---	---	Moderate	Low	Low.
523A:									
Dunham	---	>80	---	---	---	---	High	High	Moderate.
526A:									
Grundelein	---	>80	---	---	---	---	High	High	Moderate.
530B, 530C2, 530D2, 530D3, 530E, 530F:									
Ozaukee	Dense material	20-40	---	---	---	---	Moderate	High	Low.
531B, 531C2:									
Markham	Dense material	20-55	---	---	---	---	Moderate	Moderate	Moderate.
535B:									
Orthents, stony	---	>80	---	---	---	---	Moderate	Low	Low.
541B:									
Graymont	---	>80	---	---	---	---	High	High	Moderate.

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
557A:									
Millstream	---	>80	---	---	---	---	High	High	Moderate.
614A:									
Chenoa	---	>80	---	---	---	---	Moderate	High	Moderate.
696B, 696C2:									
Zurich	---	>80	---	---	---	---	High	Moderate	Moderate.
697A:									
Wauconda	---	>80	---	---	---	---	High	High	Moderate.
698B:									
Grays	---	>80	---	---	---	---	High	Moderate	Moderate.
791B:									
Rush	---	>80	---	---	---	---	High	Moderate	Moderate.
792B:									
Bowes	---	>80	---	---	---	---	High	Moderate	Moderate.
802B, 802D:									
Orthents, loamy	---	>80	---	---	---	---	Moderate	Moderate	Moderate.
805B:									
Orthents, clayey	---	>80	---	---	---	---	Moderate	High	High.
830:									
Landfills.									
848B:									
Drummer	---	>80	---	---	---	---	High	High	Moderate.
Barrington	---	>80	---	---	---	---	High	Moderate	Moderate.
Mundelein	---	>80	---	---	---	---	High	High	Moderate.
849A:									
Milford	---	>80	---	---	---	---	High	High	Low.
Martinton	---	>80	---	---	---	---	Moderate	High	Moderate.
854B:									
Markham	Dense material	20-55	---	---	---	---	Moderate	Moderate	Moderate.
Ashkum	---	>80	---	---	---	---	High	High	Moderate.

Table 21.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
854B:									
Beecher	Dense material	24-45	---	---	---	---	High	High	High.
864, 865:									
Pits.									
903A:									
Muskego	---	>80	---	---	---	35-45	High	Moderate	Moderate.
Houghton	---	>80	---	---	6-18	55-60	High	High	Moderate.
969F:									
Casco	---	>80	---	---	---	---	Moderate	Moderate	Low.
Rodman	---	>80	---	---	---	---	Low	Low	Low.
1107A:									
Sawmill	---	>80	---	---	---	---	High	High	Low.
1152A:									
Drummer	---	>80	---	---	---	---	High	High	Moderate.
1330A:									
Peotone	---	>80	---	---	---	---	High	High	Moderate.
1516A:									
Faxon	Bedrock (lithic)	20-40	---	Indurated	---	---	High	High	Low.
1523A:									
Dunham	---	>80	---	---	---	---	High	High	Moderate.
1903A:									
Muskego	---	>80	---	---	---	35-45	High	Moderate	Moderate.
Houghton	---	>80	---	---	6-18	55-60	High	High	Moderate.
3107A:									
Sawmill	---	>80	---	---	---	---	High	High	Low.
3316A:									
Romeo	Bedrock (lithic)	2-10	---	Indurated	---	---	Moderate	Moderate	Low.
4904A:									
Muskego	---	>80	---	---	---	35-45	High	Moderate	Moderate.
Peotone	---	>80	---	---	---	---	High	High	Moderate.

NRCS SOILS 37A
3/95

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

DESCRIPTION SYMBOL

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation, (national forest or park, state forest or park)
- Land grant
- Limit of soil survey (label) and/or denied access areas
- Field sheet matchline & neatline
- Previously published survey
- OTHER BOUNDARY (label)
- Airport, airfield (Davis airstrip)
- Cemetery (St Johns Cemetery)
- City / county Park (Central Park)
- STATE COORDINATE TICK
- LAND DIVISION CORNERS (section and land grants)
- GEOGRAPHIC COORDINATE TICK

TRANSPORTATION

- Divided roads
- Other roads
- # Trails

ROAD EMBLEMS & DESIGNATIONS

- Interstate (79, 79 345)
- Federal (410, 410 224)
- State (92, 92 347)
- County, farm, or ranch (376)
- RAILROAD
- POWER TRANSMISSION LINE (normally not shown)
- PIPELINE (normally not shown)
- FENCE (normally not shown)
- LEVEES
- Without road
- With road
- With railroad
- Single side slope (showing actual feature location)

DAMS

- Medium or small (W)

LANDFORM FEATURES

- Prominent Hill or Peak
- Soil Sample Site (S)

* Cultural features for use in Illinois

DESCRIPTION SYMBOL

CULTURAL FEATURES (cont.)

MISCELLANEOUS CULTURAL FEATURES

- Farmland, house (omit in urban areas)
- Church
- School
- Other Religion (label) (Mt Carmel)
- Located object (label) (Ranger Station)
- Tank (label) (Petroleum)
- Lookout Tower
- Oil and / or Natural Gas Wells
- Windmill
- Lighthouse

HYDROGRAPHIC FEATURES

STREAMS

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end

DRAINAGE AND IRRIGATION

- Double line canal (label) (CANAL)
- Perennial drainage and/or irrigation ditch
- Intermittent drainage and/or irrigation ditch

SMALL LAKES, PONDS, AND RESERVOIRS

- Perennial water
- Miscellaneous water
- Flood pool line (FLOOD POOL LINE)

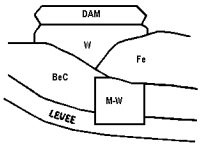
MISCELLANEOUS WATER FEATURES

- Spring
- Well, artesian
- Well, irrigation

DESCRIPTION SYMBOL

SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS



LANDFORM FEATURES

- ESCARPMENTS
  - Bedrock
  - Other than bedrock
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION, closed
- SINKHOLE

EXCAVATIONS

- PITS
  - Borrow pit
  - Gravel pit
  - Mine or quarry
- LANDFILL

MISCELLANEOUS SURFACE FEATURES

- Blowout
- Clay spot
- Gravelly spot
- Lava flow
- Marsh or swamp
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip
- Sodic spot
- Spoil area
- Stony spot
- Very stony spot
- Wet spot

RECOMMENDED AD HOC SOIL SYMBOLS

	SYMBOL_ID		SYMBOL_ID	
	1		23	
	2		24	
	3		25	
	4	Gray spot	26 GSP	
	5		27	
	6		28	
	7	Calcareous spot	29 CSP	
	8	Muck spot	30 MUC	
	9		31	
	10		32	
	11		33	
Dumps	12 DMP		34	
	13	Mine subsided Area	35 MSA	
	14		36	
Oil brine spot	15 OBS		37	
	16		38	
	17		39	
	18	Glacial Till spot	40 GLA	
	19		41	
Disturbed soil spot	20 DSS		42	
	21		43	
	22		44	

Descriptions of Special Features

Name	Description	Label
Blowout	A small saucer-, cup-, or trough-shaped hollow or depression formed by wind erosion on a preexisting sand deposit. Typically 0.2 acre to 2.0 acres.	BLO
Borrow pit	An open excavation from which soil and underlying material have been removed, usually for construction purposes. Typically 0.2 acre to 2.0 acres.	BPI
Calcareous spot	An area in which the soil contains carbonates in the surface layer. The surface layer of the named soils in the surrounding map unit is noncalcareous. Typically 0.5 acre to 2.0 acres.	CSP
Clay spot	A spot where the surface layer is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser. Typically 0.2 acre to 2.0 acres.	CLA
Depression, closed	A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage. Typically 0.2 acre to 2.0 acres.	DEP
Disturbed soil spot	An area in which the soil has been removed and materials redeposited as a result of human activity. Typically 0.25 acre to 2.0 acres.	DSS
Dumps	Areas of nonsoil material that support little or no vegetation. Typically 0.5 acre to 2.0 acres.	DMP
Escarpment, bedrock	A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.	ESB
Escarpment, nonbedrock	A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.	ESO
Glacial till spot	An exposure of glacial till at the surface of the earth. Typically 0.25 acre to 2.0 acres.	GLA
Gravel pit	An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel. Typically 0.2 acre to 2.0 acres.	GPI
Gravelly spot	A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments. Typically 0.2 acre to 2.0 acres.	GRA

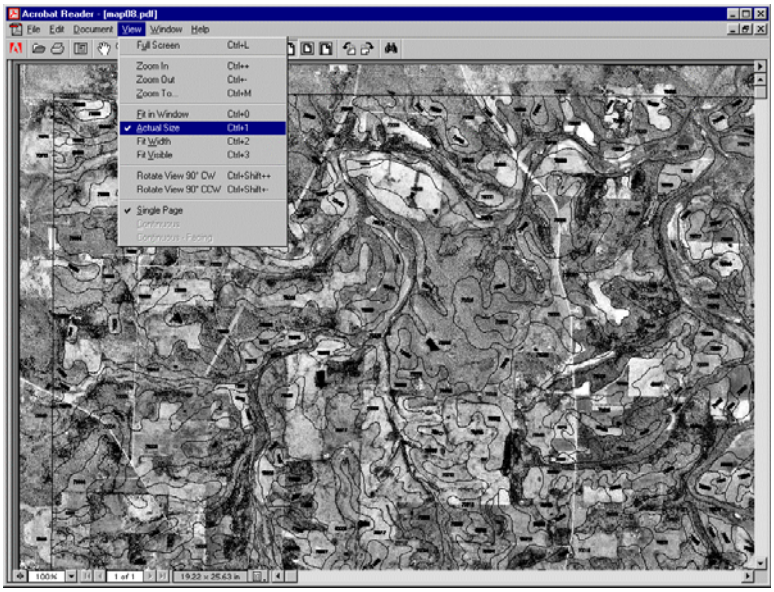
Name	Description	Label
Gray spot	A spot in which the surface layer is gray in areas where the subsurface layer of the named soils in the surrounding map unit are darker. Typically 0.25 acre to 2.0 acres.	GSP
Gully	A small channel with steep sides cut by running water through which water ordinarily runs only after a rain or after melting of snow or ice. It generally is an obstacle to wheeled vehicles and is too deep to be obliterated by ordinary tillage.	GUL
Iron bog	An accumulation of iron in the form of nodules, concretions, or soft masses on the surface or near the surface of soils. Typically 0.2 acre to 2.0 acres.	BFE
Landfill	An area of accumulated waste products of human habitation, either above or below natural ground level. Typically 0.2 acre to 2.0 acres.	LDF
Levee	An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.	LVS
Marsh or swamp	A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Typically 0.2 acre to 2.0 acres.	MAR
Mine or quarry	An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines. Typically 0.2 acre to 2.0 acres.	MPI
Mine subsided area	An area that is lower than the soils in the surrounding map unit because of subsurface coal mining. Typically 0.25 acre to 3.0 acres.	MSA
Miscellaneous water	A small, constructed body of water that is used for industrial, sanitary, or mining applications and that contains water most of the year. Typically 0.2 acre to 2.0 acres.	MIS
Muck spot	An area that occurs within an area of poorly drained or very poorly drained soil and that has a histic epipedon or an organic surface layer. The symbol is used only in map units consisting of mineral soil. Typically 0.2 acre to 2.0 acres.	MUC
Oil brine spot	An area of soil that has been severely damaged by the accumulation of oil brine, with or without liquid oily wastes. The area is typically barren but may have a vegetative cover of salt-tolerant plants. Typically 0.2 acre to 2.0 acres.	OBS
Perennial water	A small, natural or constructed lake, pond, or pit that contains water most of the year. Typically 0.2 acre to 2.0 acres.	WAT

Name	Description	Label
Rock outcrop	An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit. Typically 0.2 acre to 2.0 acres.	ROC
Saline spot	An area where the surface layer has an electrical conductivity of 8 mmhos/cm-l more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm-l or less. Typically 0.2 acre to 2.0 acres.	SAL
Sandy spot	A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer. Typically 0.2 acre to 2.0 acres.	SAN
Severely eroded spot	An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name. Typically 0.2 acre to 2.0 acres.	ERO
Short steep slope	A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.	SLP
Sinkhole	A closed depression formed either by solution of the surficial rock or by collapse of underlying caves. Typically 0.2 acre to 2.0 acres.	SNK
Slide or slip	A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces. Typically 0.2 acre to 2.0 acres.	SLI
Sodic spot	An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less. Typically 0.2 acre to 2.0 acres.	SOD
Spoil area	A pile of earthy materials, either smoothed or uneven, resulting from human activity. Typically 0.2 acre to 2.0 acres.	SPO
Stony spot	A spot where 0.01 to 0.1 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones. Typically 0.2 acre to 2.0 acres.	STN
Unclassified water	A small, natural or manmade lake, pond, or pit that contains water, of an unspecified nature, most of the year. Typically 0.2 acre to 2.0 acres.	UWT

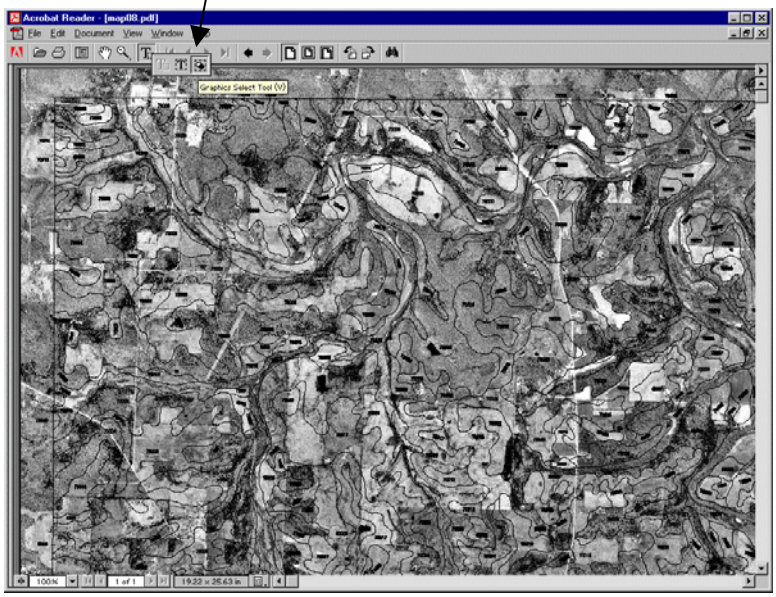
Name	Description	Label
Very stony spot	A spot where 0.1 to 3.0 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surface cover of the surrounding soil is less than 0.01 percent stones. Typically 0.2 acre to 2.0 acres.	STV
Wet depression	A shallow, concave area within an area of poorly drained or very poorly drained soils in which water is ponded for intermittent periods. The concave area is saturated for appreciably longer periods of time than the surrounding soil. Typically 0.2 acre to 2.0 acres.	WDP
Wet spot	A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit. Typically 0.2 acres to 2.0 acres.	WET

Printing Soil Survey Maps

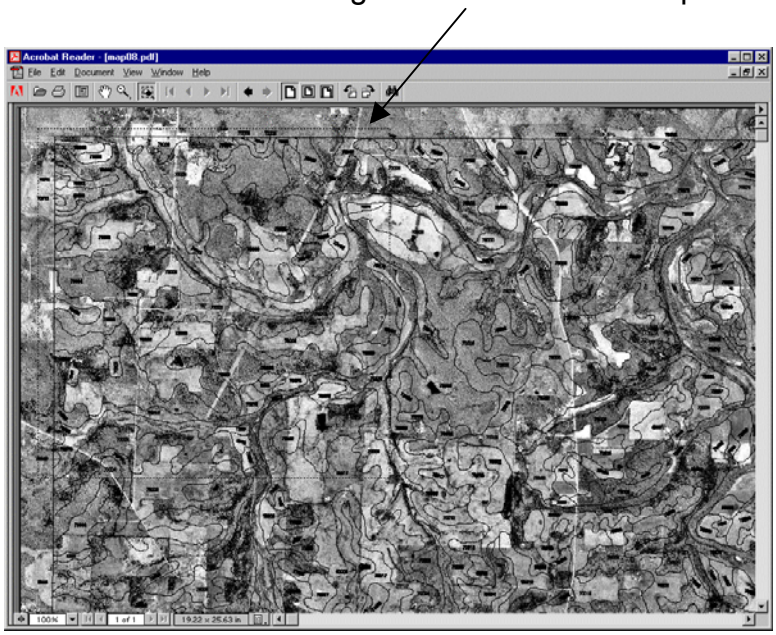
The soil survey maps were made at a scale of 1:12000 and were designed to be used at that scale. To print the maps at 1:12000 scale, set the view to Actual Size from the View pull down menu.



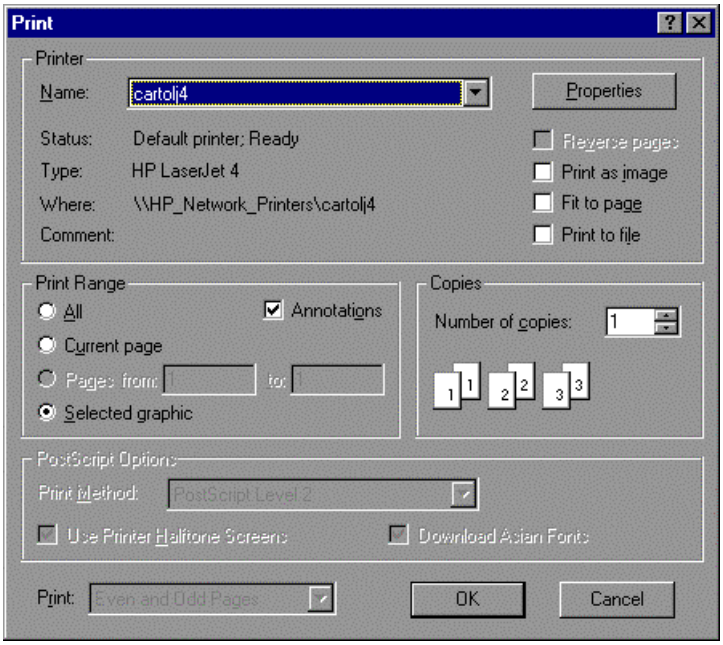
Using the pan tool, go to the area you would like to print. Select the Graphic Selection Tool by holding down the Text Selection Tool button and clicking on the Graphic Selection Tool button.



Then using the Graphic Selection Tool drag a box around the area you would like to print. Note dashed lines forming a box around area to print.

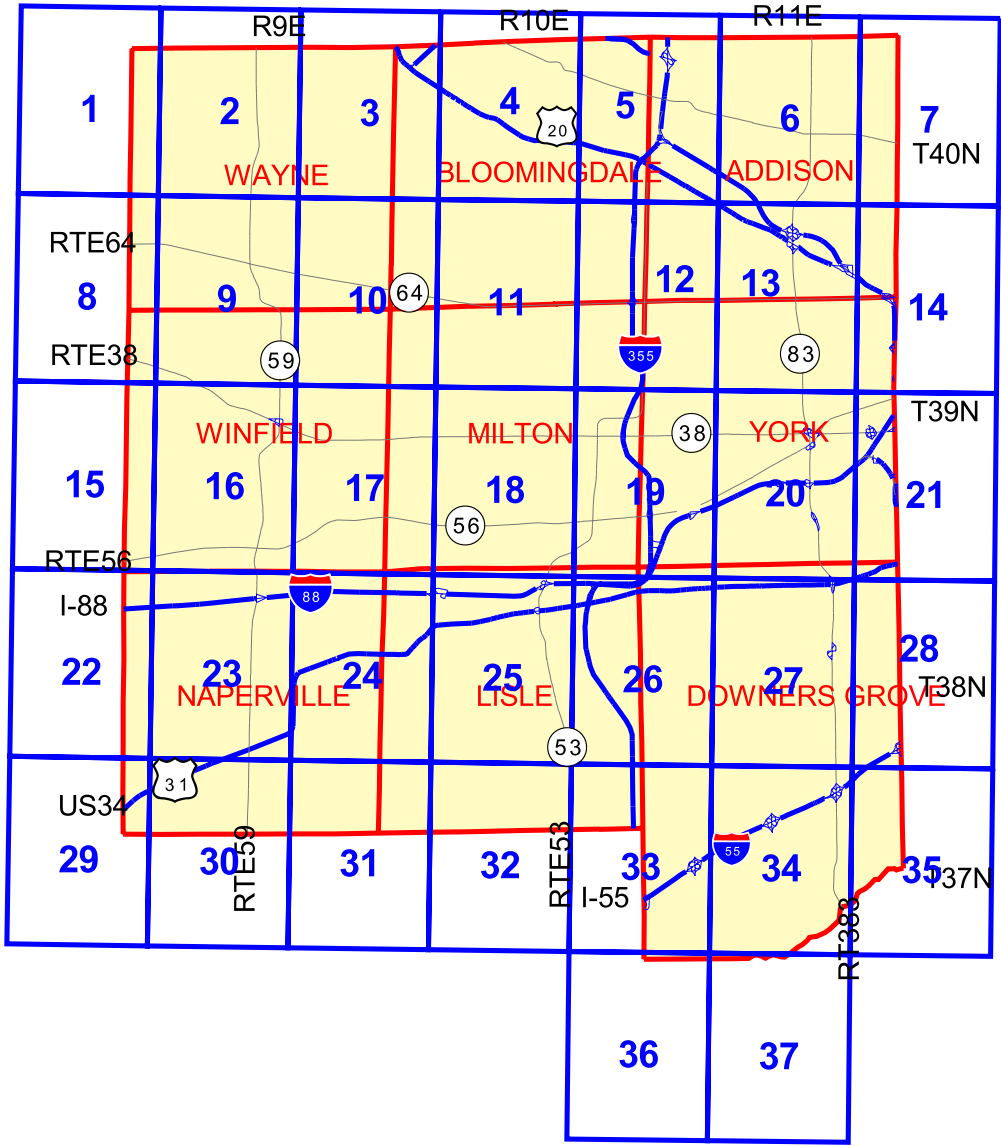


Select File Print. The Print Range will be set to Selected graphic. Click OK and the map will be sent to the printer.



DuPage County, Illinois
Index to atlas sheets.

Click on a blue number to view soil map of area



UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
GENEVA NE QUADRANGLE
SHEET NUMBER 1 OF 37

88°18′45″ 42°00′00″ — 392000m E — 393 — 394 — 395 — 396 — 88°15′00″ 42°00′00″

4649000m N — 4650 — 4648 — 4647 — 4646 — 4645 — 4644000m N

COOK COUNTY — R. 9 E. — KANE COUNTY — T. 40 N.

6 — 7 — 18 — 19

Norton Creek — water — water — Illinois — Prairie

41°56′15″ 88°18′45″ — 392000m E — 393 — 394 — 395 — 396 — 41°56′15″ 88°15′00″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 ELGIN SW
2 ELGIN SE
3 STREAMWOOD SW
4 GENEVA NW
5 WEST CHICAGO NW (SHEET 2)
6 GENEVA SW
7 GENEVA SE (SHEET 8)
8 WEST CHICAGO SW (SHEET 9)

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GENEVA NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 1 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
WEST CHICAGO NW QUADRANGLE
SHEET NUMBER 2 OF 37

88°15′00″ 42°00′00″ — 397000m E — 398 — 399 — 400 — 401 — 88°11′15″ 42°00′00″

4649000m N — 4650 — 4649000m N — 4648 — 4647 — 4646 — 4645 — 4644000m N

R. 9 E. — COOK COUNTY — T. 40 N.

Barlett — Wayne — Wayne Grove County Forest Preserve — Prairie Wayne Woods Forest Preserve

41°56′15″ 88°15′00″ — 397000m E — 398 — 399 — 400 — 401 — 41°56′15″ 88°11′15″

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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 ELGIN SE
2 STREAMWOOD SW
3 STREAMWOOD SE
4 GENEVA NE (SHEET 1)
5 WEST CHICAGO NE (SHEET 3)
6 GENEVA SE (SHEET 8)
7 WEST CHICAGO SW (SHEET 9)
8 WEST CHICAGO SE (SHEET 10)

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WEST CHICAGO NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 2 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
WEST CHICAGO NE QUADRANGLE
SHEET NUMBER 3 OF 37

88°11'15" 42°00'00" 402000m E 403 404 405 406 88°07'30" 42°00'00"

4649000m N 4648 4647 4646 4645 4644000m N 4650 4649000m N 4648 4647 4645 4644000m N

COOK COUNTY R. 9 E. | R. 10 E.

Bartlett Ontarioville Wayne Center CAROL STREAM Cloverdale

ELGIN - O'HARE EXPRESSWAY

Mallard Lake Forest Preserve

water

T. 40 N.

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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 STREAMWOOD SW
2 STREAMWOOD SE
3 PALATINE SW
4 WEST CHICAGO NW (SHEET 2)
5 LOMBARD NW (SHEET 4)
6 WEST CHICAGO SW (SHEET 9)
7 WEST CHICAGO SE (SHEET 10)
8 LOMBARD SW (SHEET 11)

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WEST CHICAGO NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 3 OF 37

41°56'15" 88°11'15" 402000m E 403 404 405 406 41°56'15" 88°07'30"

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
LOMBARD NW QUADRANGLE
SHEET NUMBER 4 OF 37

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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 STREAMWOOD SE 2 PALATINE SW 3 PALATINE SE
4		5	4 WEST CHICAGO NE (SHEET 3) 5 LOMBARD NE (SHEET 5)
6	7	8	6 WEST CHICAGO SE (SHEET 10) 7 LOMBARD SW (SHEET 11) 8 LOMBARD SE (SHEET 12)

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LOMBARD NW, ILLINOIS
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
LOMBARD NE QUADRANGLE
SHEET NUMBER 5 OF 37

88°03′45″ 42°00′00″ — 13 000mE — 14 — 15 — 16 — 17 — 88°00′00″ 42°00′00″

4650 — 4649 000mN — 4648 — 4647 — 4646 — 4645 — 4644 000mN

COOK COUNTY — R. 10 E. — R. 11 E.

T. 40 N

MEDINAH — ITASCA — WOOD DALE — ADDISON

Lake Kadijah

Salt Creek — Meacham Creek — Spring Brook

ELGIN O'HARE EXPRESSWAY

1 2 3 4 5 6 7 8 11 12 13 14 17 18 19 20 23 24

19 — 20 — 53 — 290 — 355 — 366

41°56′15″ 12 000mE 13 14 15 16 17 000mE 88°00′00″ 88°03′45″

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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 PALATINE SW
2 PALATINE SE
3 ARLINGTON HEIGHTS SW
4 LOMBARD NW (SHEET 4)
5 ELMHURST NW (SHEET 6)
6 LOMBARD SW (SHEET 11)
7 LOMBARD SE (SHEET 12)
8 ELMHURST SW (SHEET 13)

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LOMBARD NE, ILLINOIS
3.75 MINUTE SERIES
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
ELMHURST NW QUADRANGLE
SHEET NUMBER 6 OF 37

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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 PALATINE SE 2 ARLINGTON HEIGHTS SW 3 ARLINGTON HEIGHTS SE
4		5	4 LOMBARD NE (SHEET 5) 5 ELMHURST NE (SHEET 7)
6	7	8	6 LOMBARD SE (SHEET 12) 7 ELMHURST SW (SHEET 13) 8 ELMHURST SE (SHEET 14)

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ELMHURST NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 6 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
ELMHURST NE QUADRANGLE
SHEET NUMBER 7 OF 37

87°56'15" 42°00'00"

87°56'15" 42°00'00"

SCALE 1:12000

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NORTH

QUARTER QUADRANGLE LOCATION

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3	1 ARLINGTON HEIGHTS SW 2 ARLINGTON HEIGHTS SE 3 PARK RIDGE SW 4 ELMHURST NW (SHEET 6) 5 RIVER FOREST NW 6 ELMHURST SW (SHEET 13) 7 ELMHURST SE (SHEET 14) 8 RIVER FOREST SW
4		5	
6	7	8	

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ELMHURST NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 7 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
GENEVA SE QUADRANGLE
SHEET NUMBER 8 OF 37

88°18′45″ 41°56′15″ 92 000m E 93 94 95 R. 9 E. 96 88°15′00″ 41°56′15″

46 42 000m N 46 41 46 40 46 39 46 38 46 37 000m N

41°52′30″ 88°18′45″ 92 000m E 93 94 95 96 88°15′00″ 41°52′30″

DUPAGE COUNTY
KANE COUNTY
T. 39 N. | T. 40 N.
AIRPORT
water
R. R.

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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3	1 GENEVA NW 2 GENEVA NE (SHEET 1) 3 WEST CHICAGO NW (SHEET 2) 4 GENEVA SW 5 WEST CHICAGO SW (SHEET 9) 6 AURORA NORTH NW 7 AURORA NORTH NE (SHEET 15) 8 NAPERVILLE NW (SHEET 16)
4		5	
6	7	8	

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GENEVA SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 8 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
WEST CHICAGO SW QUADRANGLE
SHEET NUMBER 9 OF 37

88°15′00″ 41°56′15″ — 397000m E — 398 — R. 9 E. — 399 — 400 — 401 — 88°11′15″ 41°56′15″

4642000mN — 43 — 42 — 41 — 40 — 39 — 38 — 4637000mN

T. 39 N. | T. 40 N.

88°15′00″ 41°52′30″ — 397000mE — 398 — 1330A — 399 — 400 — 401 — 88°11′15″ 41°52′30″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 GENEVA NE (SHEET 1)
2 WEST CHICAGO NW (SHEET 2)
3 WEST CHICAGO NE (SHEET 3)
4 GENEVA SE (SHEET 8)
5 WEST CHICAGO SE (SHEET 10)
6 AURORA NORTH NE (SHEET 15)
7 NAPERVILLE NW (SHEET 16)
8 NAPERVILLE NE (SHEET 17)

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WEST CHICAGO SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 9 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
WEST CHICAGO SE QUADRANGLE
SHEET NUMBER 10 OF 37

88°11'15" 41°56'15" — 402000m E 403 404 R. 9 E. | R. 10 E. W 406 88°07'30" 41°56'15"

88°11'15" 41°52'30" — 402000m E 403 404 405 406 88°07'30" 41°52'30"

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 WEST CHICAGO NW (SHEET 2)
2 WEST CHICAGO NE (SHEET 3)
3 LOMBARD NW (SHEET 4)
4 WEST CHICAGO SW (SHEET 9)
5 LOMBARD SW (SHEET 11)
6 NAPERVILLE NW (SHEET 16)
7 NAPERVILLE NE (SHEET 17)
8 WHEATON NW (SHEET 18)

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WEST CHICAGO SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 10 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
LOMBARD SW QUADRANGLE
SHEET NUMBER 11 OF 37

88°07′30″ 41°56′15″ — 88°03′45″ 41°56′15″ — 41°52′30″ 88°07′30″ — 41°52′30″ 88°03′45″

R. 10 E.

T. 39 N. | T. 40 N.

CAROL STREAM
GLENDALE HEIGHTS
Gretna
WHEATON
(county seat)
GLEN ELLYN
CREEK
WESTERN
ILLINOIS
PRAIRIE
PATH
TRAIL
R.R.

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 WEST CHICAGO NE (SHEET 3)
2 LOMBARD NW (SHEET 4)
3 LOMBARD NE (SHEET 5)
4 WEST CHICAGO SE (SHEET 10)
5 LOMBARD SE (SHEET 12)
6 NAPERVILLE NE (SHEET 17)
7 WHEATON NW (SHEET 18)
8 WHEATON NE (SHEET 19)

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LOMBARD SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 11 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
LOMBARD SE QUADRANGLE
SHEET NUMBER 12 OF 37

88°03′45″ — 88°00′00″ — 41°56′15″ — 41°52′30″

R. 10 E. | R. 11 E.

T. 39 N. | T. 40 N.

GLENDALE HEIGHTS — NORTH GLEN ELLYN — GLEN ELLYN — ADDISON — LOMBARD — Glen Oak — Lake Ellyn — water — Babcock Ditch — Prairie Path — R. R. — ILLINOIS — WESTERN TRAIL

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3	1 LOMBARD NW (SHEET 4)
4		5	2 LOMBARD NE (SHEET 5)
6	7	8	3 ELMHURST NW (SHEET 6)
			4 LOMBARD SW (SHEET 11)
			5 ELMHURST SW (SHEET 13)
			6 WHEATON NW (SHEET 18)
			7 WHEATON NE (SHEET 19)
			8 HINSDALE NW (SHEET 20)

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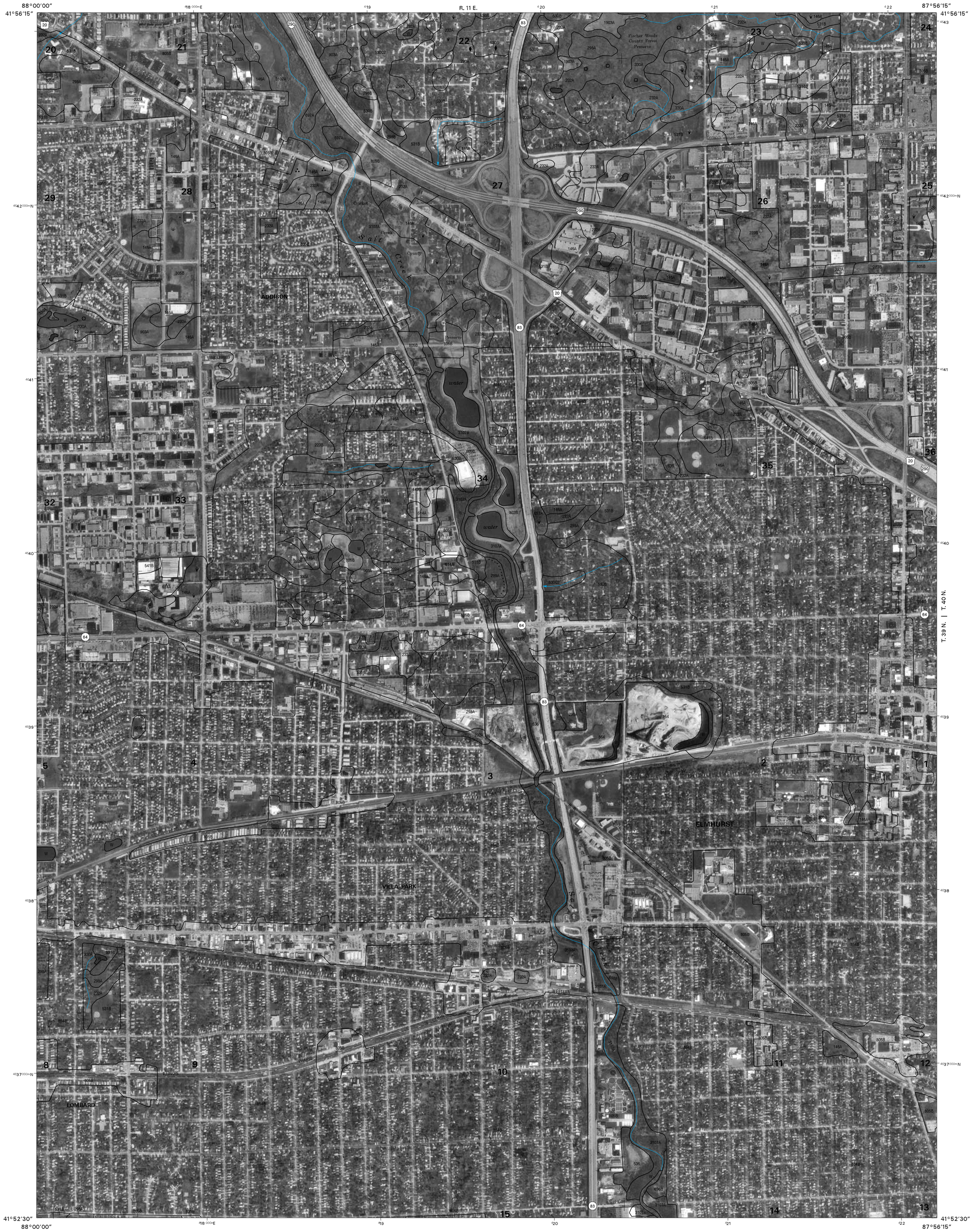
LOMBARD SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 12 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
ELMHURST SW QUADRANGLE
SHEET NUMBER 13 OF 37



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3	1 LOMBARD NE (SHEET 5)
			2 ELMHURST NW (SHEET 6)
			3 ELMHURST NE (SHEET 7)
4		5	4 LOMBARD SE (SHEET 12)
			5 ELMHURST SE (SHEET 14)
			6 WHEATON NE (SHEET 19)
6	7	8	7 HINSDALE NW (SHEET 20)
			8 HINSDALE NE (SHEET 21)

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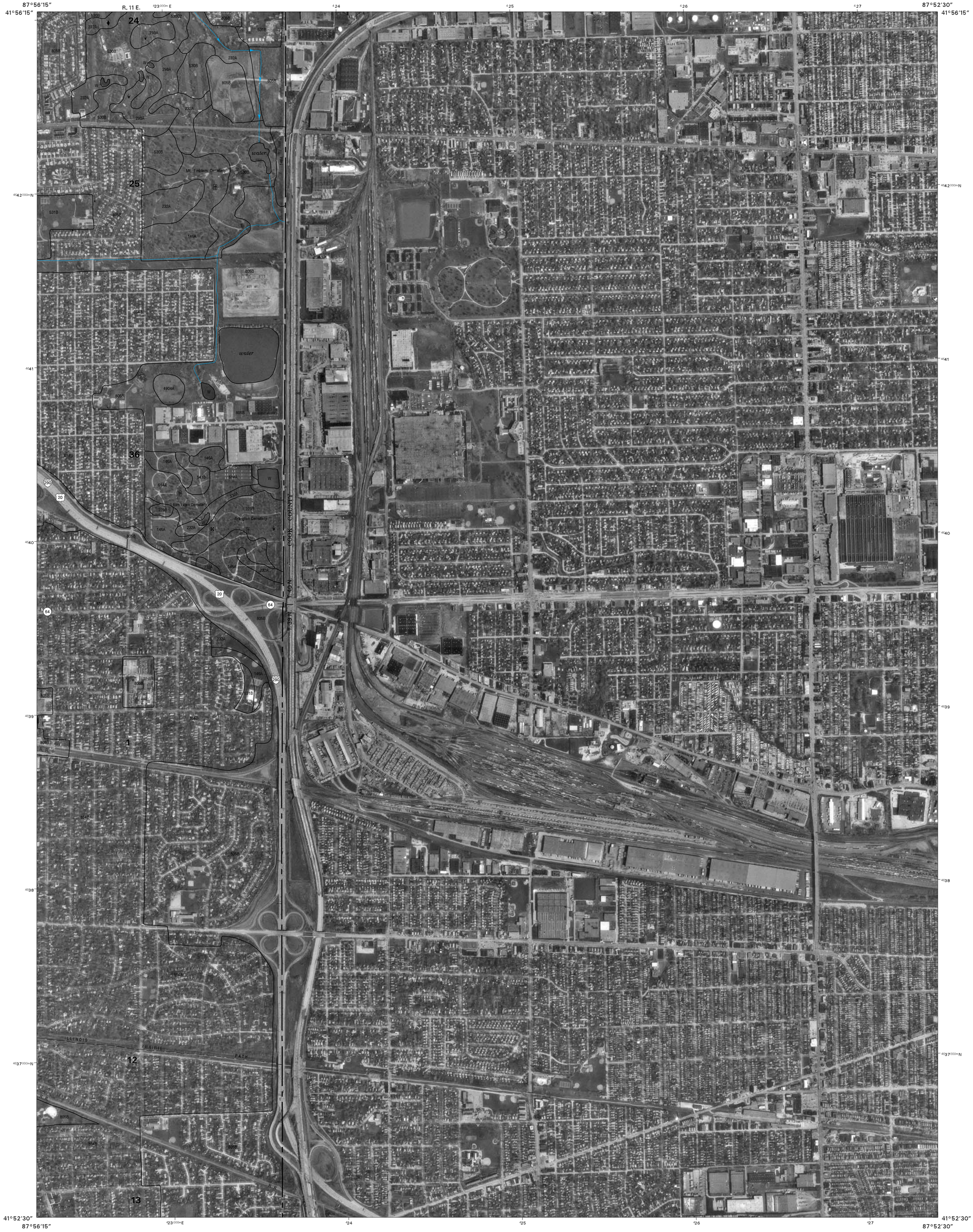
ELMHURST SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 13 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
ELMHURST SE QUADRANGLE
SHEET NUMBER 14 OF 37



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 ELMHURST NW (SHEET 6)
2 ELMHURST NE (SHEET 7)
3 RIVER FOREST NW
4 ELMHURST SW (SHEET 13)
5 RIVER FOREST SW
6 HINSDALE NW (SHEET 20)
7 HINSDALE NE (SHEET 21)
8 BERWYN NW

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ELMHURST SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 14 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
AURORA NORTH NE QUADRANGLE
SHEET NUMBER 15 OF 37

88°18′45″ 41°52′30″ 88°15′00″ 41°48′45″

R. 9 E.

T. 39 N.

KANE COUNTY

Fermi National Accelerator Laboratory

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 GENEVA SW
2 GENEVA SE (SHEET 8)
3 WEST CHICAGO SW (SHEET 9)
4 AURORA NORTH NW
5 NAPERVILLE NW (SHEET 16)
6 AURORA NORTH SW
7 AURORA NORTH SE (SHEET 22)
8 NAPERVILLE SW (SHEET 23)

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AURORA NORTH NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 15 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
NAPERVILLE NW QUADRANGLE
SHEET NUMBER 16 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 GENEVA SE (SHEET 8)
2 WEST CHICAGO SW (SHEET 9)
3 WEST CHICAGO SE (SHEET 10)
4 AURORA NORTH NE (SHEET 15)
5 NAPERVILLE NE (SHEET 17)
6 AURORA NORTH SE (SHEET 22)
7 NAPERVILLE SW"(SHEET 23)
8 NAPERVILLE SE (SHEET 24)

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NAPERVILLE NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 16 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
NAPERVILLE NE QUADRANGLE
SHEET NUMBER 17 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 WEST CHICAGO SW (SHEET 9)
2 WEST CHICAGO SE (SHEET 10)
3 LOMBARD SW (SHEET 11)
4 NAPERVILLE NW (SHEET 16)
5 WHEATON NW (SHEET 18)
6 NAPERVILLE SW (SHEET 23)
7 NAPERVILLE SE (SHEET 24)
8 WHEATON SW (SHEET 25)

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NAPERVILLE NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 17 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
WHEATON NW QUADRANGLE
SHEET NUMBER 18 OF 37

88°07′30″ 41°52′30″ — 407.000mE 408 409 R. 10 E. 410 411 — 88°03′45″ 41°52′30″

4635.000mN 4634 4633 4632 4631 4630.000mN

T. 38 N. | T. 39 N.

WHEATON
(county seat)

GLEN ELLYN

VALLEY VIEW

Morton Arboretum

water

ILLINOIS PRAIRIE PATH

DuPage River

East Branch DuPage River

Wheaton Cemetery

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

NORTH

QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 WEST CHICAGO SE (SHEET 10)
2 LOMBARD SW (SHEET 11)
3 LOMBARD SE (SHEET 12)
4 NAPERVILLE NE (SHEET 17)
5 WHEATON NE (SHEET 19)
6 NAPERVILLE SE (SHEET 24)
7 WHEATON SW (SHEET 25)
8 WHEATON SE (SHEET 26)

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

WHEATON NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 18 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
WHEATON NE QUADRANGLE
SHEET NUMBER 19 OF 37

88°03′45″ 41°52′30″ — 88°00′00″ 41°52′30″

R. 10 E. | R. 11 E.

12 000mE 13 14 15 16 17 000mE

46°36 46°35 000mN 46°34 46°33 46°32 46°31 46°30 000mN

GLEN ELLYN
LOMBARD
Flowerfield
Highland Hills
DOWNERS GROVE
Arlington Ridge Cemetery
Morton Arboretum
Valley View

11 12 13 14 7 18 17 23 24 19 20 26 25 30 29 31 32 35 36 1 2 6 5

Dry Ridge
Branch
East
Lateral
Creek
water

T. 38 N. | T. 39 N.

41°48′45″ 88°03′45″ — 41°48′45″ 88°00′00″

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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 LOMBARD SW (SHEET 11)
2 LOMBARD SE (SHEET 12)
3 ELMHURST SW (SHEET 13)
4 WHEATON NW (SHEET 18)
5 HINSDALE NW (SHEET 20)
6 WHEATON SW (SHEET 25)
7 WHEATON SE (SHEET 26)
8 HINSDALE SW (SHEET 27)

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WHEATON NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 19 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
HINSDALE NW QUADRANGLE
SHEET NUMBER 20 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3	1 LOMBARD SE (SHEET 12) 2 ELMHURST SW (SHEET 13) 3 ELMHURST SE (SHEET 14) 4 WHEATON NE (SHEET 19) 5 HINSDALE NE (SHEET 21) 6 WHEATON SE (SHEET 26) 7 HINSDALE SW (SHEET 27) 8 HINSDALE SE (SHEET 28)
4		5	
6	7	8	

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HINSDALE NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 20 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
HINSDALE NE QUADRANGLE
SHEET NUMBER 21 OF 37

87°56′15″ 41°52′30″ — R. 11 E. — 423000m E — 424 — 425 — 426 — 427 — 87°52′30″ 41°52′30″

4635000mN — 4634 — 4633 — 4632 — 4631 — 4630000mN

Berkeley
ELMHURST
York Woods County Forest Preserve
Fullersburg County Forest Preserve
OAK BROOK
HINSDALE
COOK COUNTY
Salt Creek
13
24
25
36
1
T. 38 N.
T. 39 N.

41°48′45″ 87°56′15″ — 423000mE — 424 — 425 — 426 — 427 — 41°48′45″ 87°52′30″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 ELMHURST SW (SHEET 13)
2 ELMHURST SE (SHEET 14)
3 RIVER FOREST SW
4 HINSDALE NW (SHEET 20)
5 BERWYN NW
6 HINSDALE SW (SHEET 27)
7 HINSDALE SE (SHEET 28)
8 BERWYN SW

INDEX TO ADJOINING 3.75 MAPS

HINSDALE NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 21 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
AURORA NORTH SE QUADRANGLE
SHEET NUMBER 22 OF 37

88°18′45″ 88°15′00″
41°48′45″ 41°48′45″
41°45′00″ 41°45′00″
88°18′45″ 88°15′00″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 AURORA NORTH NW 2 AURORA NORTH NE (SHEET 15) 3 NAPERVILLE NW (SHEET 16)
4		5	4 AURORA NORTH SW 5 NAPERVILLE SW (SHEET 23)
6	7	8	6 AURORA SOUTH NW 7 AURORA SOUTH NE (SHEET 29) 8 NORMANTOWN NW (SHEET 30)

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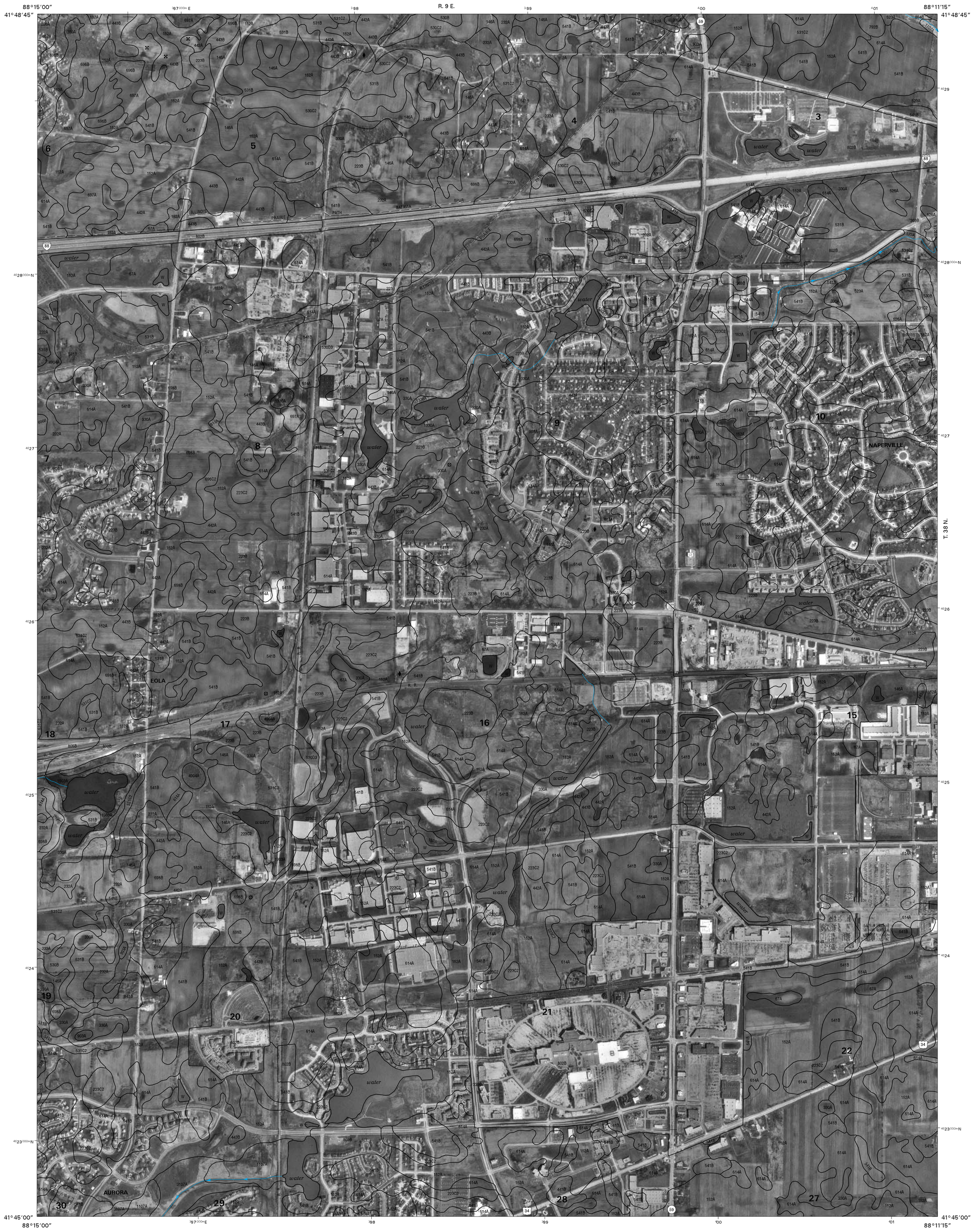
AURORA NORTH SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 22 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
NAPERVILLE SW QUADRANGLE
SHEET NUMBER 23 OF 37



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

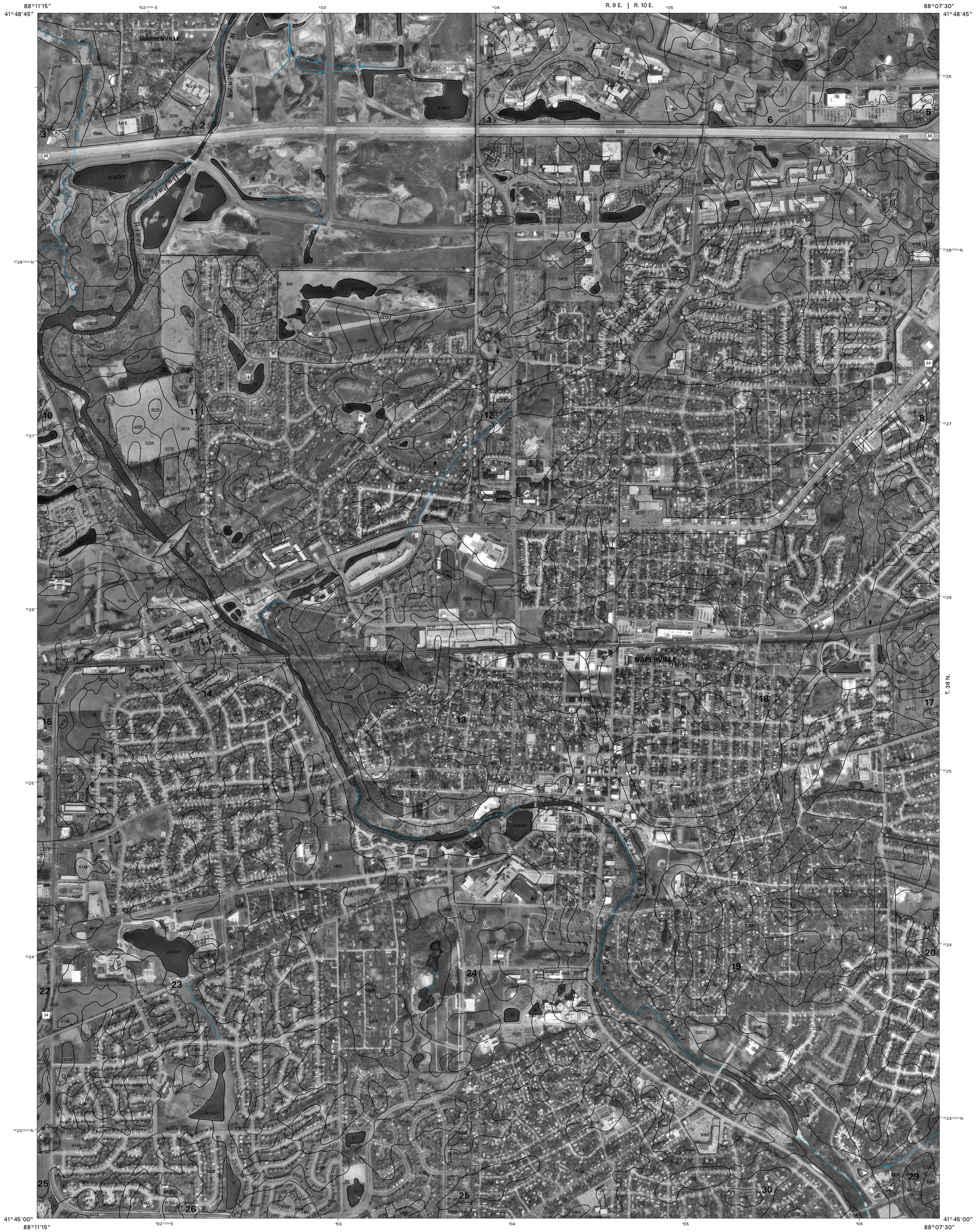
1 AURORA NORTH NE (SHEET 15)
2 NAPERVILLE NW (SHEET 16)
3 NAPERVILLE NE (SHEET 17)
4 AURORA NORTH SE (SHEET 22)
5 NAPERVILLE SE (SHEET 24)
6 AURORA SOUTH NE (SHEET 29)
7 NORMANTOWN NW (SHEET 30)
8 NORMANTOWN NE (SHEET 31)

INDEX TO ADJOINING 3.75 MAPS

NAPERVILLE SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 23 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
NAPERVILLE SE QUADRANGLE
SHEET NUMBER 24 OF 37



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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 NAPERVILLE NW (SHEET 16) 2 NAPERVILLE NE (SHEET 17) 3 WHEATON NW (SHEET 18)
4		5	4 NAPERVILLE SW (SHEET 23) 5 WHEATON SW (SHEET 25)
6	7	8	6 NORMANTOWN NW (SHEET 30) 7 NORMANTOWN NE (SHEET 31) 8 ROMEOVILLE NW (SHEET 32)

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NAPERVILLE SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 24 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
WHEATON SW QUADRANGLE
SHEET NUMBER 25 OF 37

88°07′30″ 41°48′45″ — 407 000m E — 408 — R. 10 E. — 409 — 410 — 411 — 88°03′45″ 41°48′45″

4628 000m N — 4627 — 4626 — 4625 — 4624 — 4623 000m N

T. 38 N.

Lisle — NAPERVILLE — Morton Arboretum — St. Joseph Creek — East Branch DuPage River — Four Lakes — Prentiss Creek — West Branch DuPage River

41°45′00″ 88°07′30″ — 407 000m E — 408 — 409 — 410 — 411 — 88°03′45″ 41°45′00″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 NAPERVILLE NE (SHEET 17)
2 WHEATON NW (SHEET 18)
3 WHEATON NE (SHEET 19)
4 NAPERVILLE SE (SHEET 24)
5 WHEATON SE (SHEET 26)
6 NORMANTOWN NE (SHEET 31)
7 ROMEOVILLE NW (SHEET 32)
8 ROMEOVILLE NE (SHEET 33)

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WHEATON SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 25 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
WHEATON SE QUADRANGLE
SHEET NUMBER 26 OF 37

88°03′45″ 41°48′45″ — 412 000mE — 413 — R. 10 E. | R. 11 E. — 415 — 416 — 88°00′00″ 41°48′45″

4628 000mN — 4629 — 4627 — 4626 — 4625 — 4624 — 4623 000mN

T. 38 N.

DOWNERS GROVE — Belmont — LISLE — DOWNER GROVE — WOODRIDGE

St. Joseph Creek — Prentiss Creek — Maple Grove — County Forest Preserve — water

88°03′45″ 41°45′00″ — 412 000mE — 413 — 414 — 415 — 416 — 88°00′00″ 41°45′00″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 WHEATON NW (SHEET 18)
2 WHEATON NE (SHEET 19)
3 HINSDALE NW (SHEET 20)
4 WHEATON SW (SHEET 25)
5 HINSDALE SW (SHEET 27)
6 ROMEOVILLE NW (SHEET 32)
7 ROMEOVILLE NE (SHEET 33)
8 SAG BRIDGE NW (SHEET 34)

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WHEATON SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 26 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
HINSDALE SW QUADRANGLE
SHEET NUMBER 27 OF 37

88°00′00″ 87°56′15″
41°48′45″ 41°45′00″
R. 11 E.
T. 38 N.
417 000mE 418 419 420 421 422 000mE
4628 000mN 4627 4626 4625 4624 4623 000mN

WESTMONT
DOWNERS GROVE
CLARENDON HILLS
HINSDALE
DARIEN
WILLOWBROOK
Clarendon Hills Cemetery
Golfview Lake
Ruth Lake
water

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 WHEATON NE (SHEET 19)
4		5	2 HINSDALE NW (SHEET 20)
6	7	8	3 HINSDALE NE (SHEET 21)
			4 WHEATON SE (SHEET 26)
			5 HINSDALE SE (SHEET 28)
			6 ROMEOVILLE NE (SHEET 33)
			7 SAG BRIDGE NW (SHEET 34)
			8 SAG BRIDGE NE (SHEET 35)

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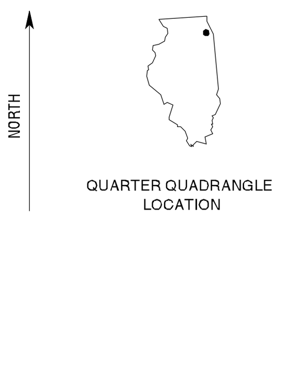
HINSDALE SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 27 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
HINSDALE SE QUADRANGLE
SHEET NUMBER 28 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 HINSDALE NW (SHEET 20)
2 HINSDALE NE (SHEET 21)
3 BERWYN NW
4 HINSDALE SW (SHEET 27)
5 BERWYN SW
6 SAG BRIDGE NW (SHEET 34)
7 SAG BRIDGE NE (SHEET 35)
8 PALOS PARK NW

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HINSDALE SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 28 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
AURORA SOUTH NE QUADRANGLE
SHEET NUMBER 29 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 AURORA NORTH SW 2 AURORA NORTH SE (SHEET 22) 3 NAPERVILLE SW (SHEET 23)
4		5	4 AURORA SOUTH NW 5 NORMANTOWN NW (SHEET 30)
6	7	8	6 AURORA SOUTH SW 7 AURORA SOUTH SE 8 NORMANTOWN SW

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AURORA SOUTH NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 29 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
NORMANTOWN NW QUADRANGLE
SHEET NUMBER 30 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 AURORA NORTH SE (SHEET 22)
2 NAPERVILLE SW (SHEET 23)
3 NAPERVILLE SE (SHEET 24)
4 AURORA SOUTH NE (SHEET 29)
5 NORMANTOWN NE (SHEET 31)
6 AURORA SOUTH SE
7 NORMANTOWN SW
8 NORMANTOWN SE

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NORMANTOWN NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 30 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
NORMANTOWN NE QUADRANGLE
SHEET NUMBER 31 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3	1 NAPERVILLE SW (SHEET 23) 2 NAPERVILLE SE (SHEET 24) 3 WHEATON SW (SHEET 25)
4		5	4 NORMANTOWN NW (SHEET 30) 5 ROMEOVILLE NW (SHEET 32)
6	7	8	6 NORMANTOWN SW 7 NORMANTOWN SE 8 ROMEOVILLE SW

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NORMANTOWN NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 31 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
ROMEOVILLE NW QUADRANGLE
SHEET NUMBER 32 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 NAPERVILLE SE (SHEET 24)
4		5	2 WHEATON SW (SHEET 25)
6	7	8	3 WHEATON SE (SHEET 26)
			4 NORMANTOWN NE (SHEET 31)
			5 ROMEOVILLE NE (SHEET 33)
			6 NORMANTOWN SE
			7 ROMEOVILLE SW
			8 ROMEOVILLE SE (SHEET 36)

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ROMEOVILLE NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 32 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
ROMEOVILLE NE QUADRANGLE
SHEET NUMBER 33 OF 37

88°03′45″ 41°45′00″ — 412 000mE 413 414 R. 10 E. | R. 11 E. 415 416 — 88°00′00″ 41°45′00″

4621 000mN 4620 4619 4618 4617 4616 000mN

T. 37 N. | T. 38 N.

WOODRIDGE
DARIEN
WILL COUNTY
WILL COUNTY
ARGONNE NATIONAL LABORATORY RESERVATION
Bruce Lake
water

41°41′15″ 88°03′45″ — 412 000mE 413 414 415 416 — 41°41′15″ 88°00′00″

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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3	1 WHEATON SW (SHEET 25)
			2 WHEATON SE (SHEET 26)
			3 HINSDALE SW (SHEET 27)
4		5	4 ROMEOVILLE NW (SHEET 32)
			5 SAG BRIDGE NW (SHEET 34)
			6 ROMEOVILLE SW
6	7	8	7 ROMEOVILLE SE (SHEET 36)
			8 SAG BRIDGE SW (SHEET 37)

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ROMEOVILLE NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 33 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
AURORA NORTH NE QUADRANGLE
SHEET NUMBER 34 OF 37

88°00′00″ — 87°56′15″ — 41°45′00″ — 41°41′15″

R. 11 E.

T. 38 N. | T. 37 N.

17 000mE — 18 — 19 — 20 — 21 — 22 000m E

4621 000mN — 4622 — 4620 — 4619 — 4618 — 4617 — 4616 000mN

DOWNERS GROVE
DARIEN
WILLOWBROOK
ARGONNE NATIONAL LABORATORY RESERVATION
Sawmill Creek
DES PLAINES RIVER
CHICAGO SANITARY AND SHIP CANAL
CALUMET-SAG CHANNEL
COOK COUNTY FOREST PRESERVE TRAIL
R. R.

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 WHEATON SE (SHEET 26)
2 HINSDALE SW (SHEET 27)
3 HINSDALE SE (SHEET 28)
4 ROMEOVILLE NE (SHEET 33)
5 SAG BRIDGE NE (SHEET 35)
6 ROMEOVILLE SE (SHEET 36)
7 SAG BRIDGE SW (SHEET 37)
8 SAG BRIDGE SE

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AURORA NORTH NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 34 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
SAG BRIDGE NE QUADRANGLE
SHEET NUMBER 35 OF 37

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993-94 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 HINSDALE SW (SHEET 27)
2 HINSDALE SE (SHEET 28)
3 BERWYN SW
4 SAG BRIDGE NW (SHEET 34)
5 PALOS PARK NW
6 SAG BRIDGE SW (SHEET 37)
7 SAG BRIDGE SE
8 PALOS PARK SW

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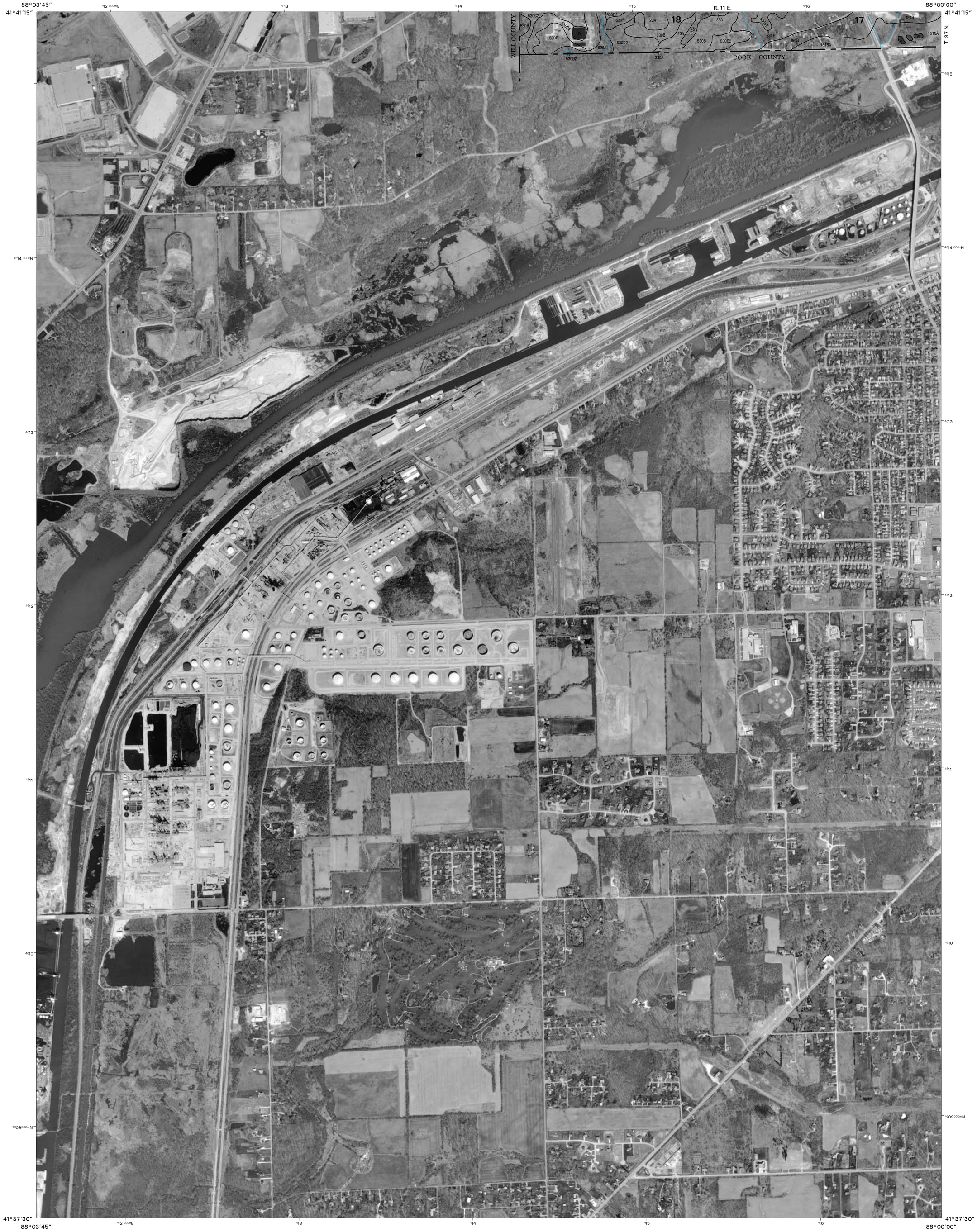
SAG BRIDGE NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 35 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
ROMEOVILLE SE QUADRANGLE
SHEET NUMBER 36 OF 37



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 ROMEOVILLE NW (SHEET 32) 2 ROMEOVILLE NE (SHEET 33) 3 SAG BRIDGE NW (SHEET 34) 4 ROMEOVILLE SW 5 SAG BRIDGE SW (SHEET 37) 6 JOLIET NW 7 JOLIET NE 8 MOKENA NW
4		5	
6	7	8	

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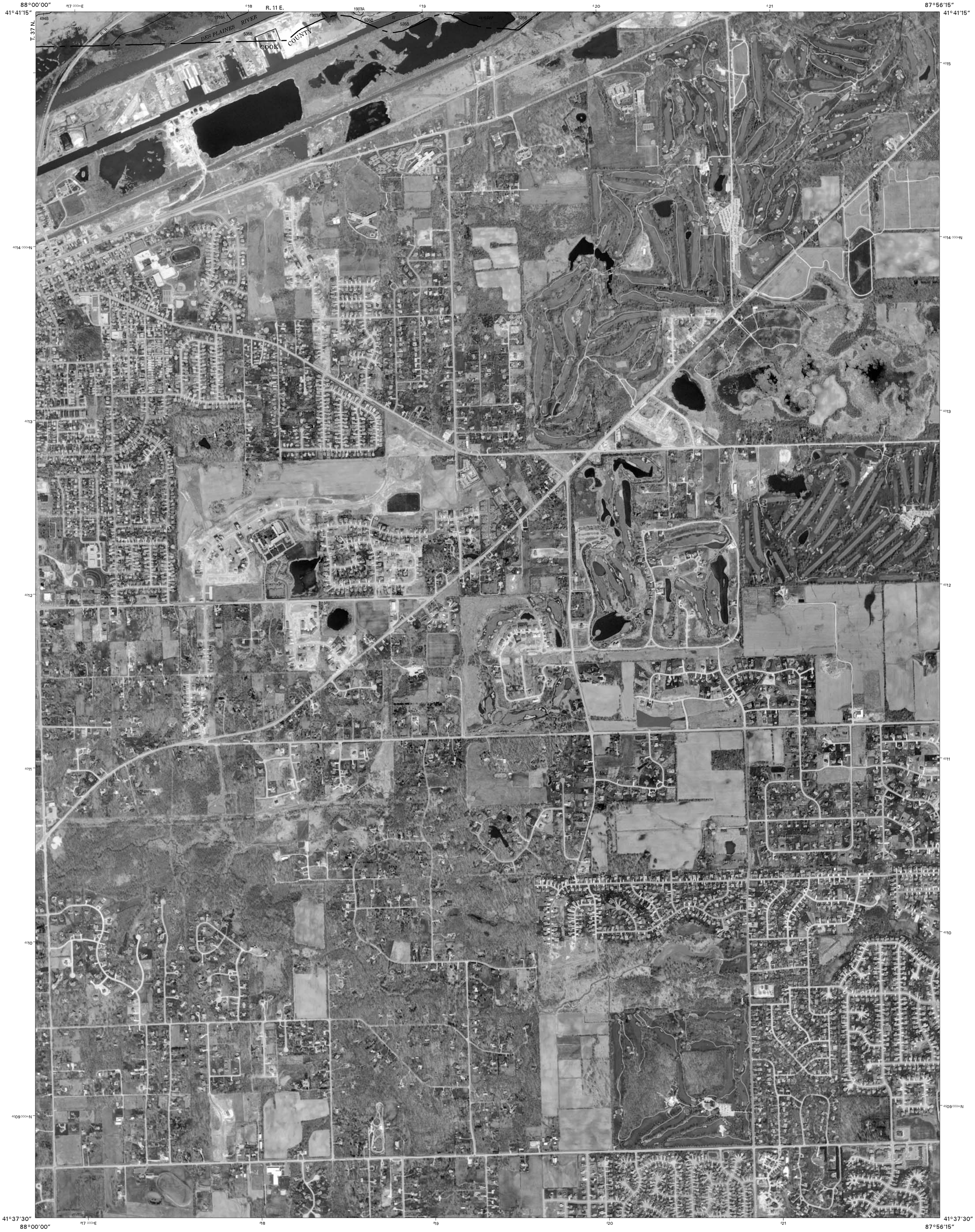
ROMEOVILLE SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 36 OF 37

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DUPAGE COUNTY, ILLINOIS
SAG BRIDGE SW QUADRANGLE
SHEET NUMBER 37 OF 37



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 ROMEOVILLE NE (SHEET 33) 2 SAG BRIDGE NW (SHEET 34) 3 SAG BRIDGE NE (SHEET 35)
4		5	4 ROMEOVILLE SE (SHEET 36) 5 SAG BRIDGE SE
6	7	8	6 JOLIET NE 7 MOKENA NW 8 MOKENA NE

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3.75 MINUTE SERIES
SHEET NUMBER 37 OF 37